

The Good Name of Science: A Discussion of Science Courses for General Education in College

Eric M. Rogers

Princeton University, Princeton, New Jersey

HOW CAN WE SAFEGUARD the good name of science among educated people? How can science courses in college and school give the general public a real understanding of science? The need is serious. This is a scientific age, in which the results of science affect everyday living, the thinking of scientists affects intellectual patterns, and scientists hold controlling knowledge and skill in industry, in warfare, and in matters that affect the whole policy of commerce and government. Lack of understanding between scientists and administrators brings difficulties and dangers. Administrators in businesses and in governments, even heads of governments themselves, all have to meet with scientists and formulate policies and make decisions which depend on scientific judgments; yet they find themselves ill prepared to understand the scientists' point of view or to assess their statements.

Just as serious is the problem of the general public, of the thinking man who wants to understand science, who needs to understand it if he is to play his part happily and wisely in our present civilization. Educated people emerge from school and college with little sympathy for science. Some boast shamelessly, later on, "I had a science course but I never made much of it." Science is considered abstruse and difficult or else a little crazy. Scientists are regarded as wizards with mysterious knowledge which they hand out either reluctantly or overfluently. Even high school science teaching supports this view by dazzling students with wonderful revelations and then discouraging them with powerful terminology.

Admittedly, this is too sweeping a condemnation. Yet how many of us believe that standard college courses (such as freshman physics), make the best contribution to a nonscientist's education? How many think that such courses alone give the best training to those who teach high school science to a new generation? At best such courses are interesting at the time; but their material is easily forgotten or muddled and they give little lasting benefit. At worst they produce bewilderment and dislike. Such results were sad in an earlier generation; now they are dan-

gerous. The general student needs and deserves science courses that are an end in themselves, courses that give him an understanding of science.

In recent years, there has been growing concern for general education courses in college to provide a civilized intellectual background in an undergraduate's education. In the field of science new courses are being planned and some have started—including a few started long ago by far-seeing colleges. Scientists emerged from the war more concerned than ever over the barriers between them and laymen. The old claim that every educated man should know some science seems less important than the new one that every educated man should *understand* science well enough to work with scientists, perhaps to take something of science into his own life.

Now with general education courses being planned and tried, serious questions are being asked about them, not just by science teachers or college presidents or professional educators, but by all who have the good name of science at heart. Each reader of this paper should pause and ask himself: What do I want my children or my neighbors' children to gain from their science courses? What do I want both the future governors and the common man of the next generation to learn of or about science? Facts and laws? Or a friendly feeling towards science and scientists, and a delight in reading scientific books? Most of us, reflecting on such questions, find ourselves asking for teaching that will give genuine understanding as well as factual knowledge, perhaps at the expense of some factual knowledge—the making of new science courses for general education comes with an urgency that justifies drastic measures.

Since a number of new science courses have been started, those responsible for them are anxious to discuss aims, methods, and progress with others working on similar courses. The present article reports informally on two such conferences, one at the Princeton Inn in 1947 and one at the Lamont Library at Harvard in 1949. Both were initiated by President Conant of Harvard, Dean French of Colgate, and Dean Taylor of Princeton. The conferences them-

selves were small, informal gatherings—more or less accidental assemblages of people with strong interests in the new science courses.¹ They were limited to small numbers by considerations of cost and by the need for a small discussion group. This article relates mainly to the first conference, discussing the need for new science courses in college, their aims, and their construction.² The second conference continued the general discussions and held sessions concerned with the role of the historian of science, the relationship between the new courses and studies in social sciences, and the training of teachers. In our discussions it appeared that many standard courses in biological science are already reasonably humane, already trying to achieve the new aims. The physical scientists had guiltier consciences. So this article applies more particularly to the physical sciences.

ORTHODOX COURSES AND NEW COURSES

In many colleges, the only science courses available for nonscientists are orthodox courses in single sciences, originally designed to provide a sound foundation for further courses in the same science. Nonscientists take these courses, under university rules enforcing broad general programs or through their own interests and choice. The emphasis in these courses is mainly on content rather than on ideas or scientific method, and there is not enough time to give thorough understanding. Their use for general education has been defended on the grounds that a thorough learning of facts and principles does give an understanding of science; that the discipline of hard study is good in itself; and that routine work in classroom and laboratory gives training in scientific method which will spread to other studies and other activities in the student's life, making him more scientific.

When we judge such courses by their practice we find them crowded with material, particularly in the

¹ The conferences were peculiar in the one-sidedness of their personnel. Practically everyone there was already in favor of the new courses. It was like a bench of bishops meeting to discuss some general issue—perhaps it would be fairer to say a meeting of ministers of many faiths gathered to consider some common project. With this select clientele there was plenty of discussion but little straining of argument across major differences of ideals. The speed with which we could clarify our ideas and discuss methods was amazing. As a form of conference to help progress, this kind of gathering deserves strong recommendation; and I hope that conferences constructed similarly will be sponsored in many parts of the educational field. Professional societies and universities might find this difficult—the limited invitation would seem undemocratic—but here is a magnificent chance for foundations, which can issue a limited number of invitations to people who will come ready for profitable discussion.

² Accounts of some of the courses discussed have been published in *Science in general education*, edited by Earl J. McGrath (Wm. C. Brown and Company, Dubuque, Iowa, 1948).

physical sciences; and when we judge them by their results we find they do not turn out many general students with a sympathetic understanding of science. So we turn to planning new courses with two special characteristics: (1) they are ends in themselves, intended for students who will study no more science, except in their own reading in later life; (2) they aim at producing sympathetic nonscientists who understand something of the nature of science, who feel they know what scientific work is like and what scientists are like, who have seen experiment and theory and critical argument used in building a structure of knowledge.

TRANSFER OF TRAINING

Our psychologist colleagues, however, give educators a serious warning about hopes that training given to a student in a science course will spread to other activities—hopes that one intellectual activity can sharpen the mind, or improve its ability for some other activity. Just such hopes have been used to defend the discipline of an orthodox course. And just such hopes lure all of us into planning to do great things with new courses, such as make people more scientific. Before we condemn orthodox courses or plan new ones, we need an answer to this key question: Will students transfer training, in some skill or habit or the use of some idea, from a science course to other studies or to life in general? If the answer is *no*, our new schemes offer little promise as part of general education. If the answer is *yes* our hopes should be grand.

In the past, educators placed great value on courses in classics, history, mathematics—in fact, on most of higher education—because they took it for granted that training in one field would transfer to many other fields and be retained as part of the student's general culture. Classics, it was claimed, trained students' minds and made them develop into scholars. In this respect, educators seem to have risked some confusion between *post hoc* and *propter hoc*—we might suspect the classical scholars had the intellect to succeed anyway. Since early this century there have been doubts about the hoped-for transfer. At first, experimental investigations said *no* to our key question; then later studies showed that transfer can occur to some extent. It certainly does not take place as easily as educators and the general public hoped. As one example, consider scientists themselves: are they better for their studies, tidy and systematic in their general life, critical and unbiased in their general thinking?

If transfer does not occur at all, higher education seems almost worthless, except for specialized professional training. Fortunately there is some transfer—language teaching can improve intellectual skills,

mathematics can give a sense of form or provide training in careful argument, and so on—but *only under certain favorable circumstances*. These favorable circumstances³ seem to be:

I. The more there is in common between the field of training and the field to which we wish it to transfer, the greater the likelihood of transfer. There need to be common elements, which may be elements of material or method or ideals. For example, if we train a student to weigh accurately in a physics laboratory, it is almost certain that this training will transfer to another physics laboratory and he will weigh the more accurately there; it is moderately certain that he will carry his good training to a chemistry laboratory; much less likely that he will carry it to any weighing he does in his own kitchen or in his business; and it is very unlikely that the training in accuracy will reappear as a habit of being accurate in other activities. Another example: training in argument learned in geometry is likely to be transferred to later geometrical studies, not very likely to be transferred to work in physics, unlikely to help the student to think critically about arguments in newspaper advertisements, and very unlikely to make him a better economist. (We can modify the gloomy doubts expressed in these examples by attending to conditions II and III.)

II. Consciously seeking transfer may help transfer. We should encourage the student to review his gains in the field of study; then we should point out their applicability to other fields. We should even urge him to look for chances of transfer and remind him that unless he transfers some of his gains to his general life, our course will be of little lasting value. (We ask the student an intellectual version of the question that is put to a child: "Now Johnny, if I give you a tennis racket, will you use it?")

III. An almost essential lubricant for transfer is emotional attachment—the extent to which the student associates feelings of enjoyment, interest, and inspiration with his studies. The more he enjoys his science and is inspired by its skills and methods, the more

³A useful 8-page report on this matter was published in 1930-31 by the British Association for the Advancement of Science. In that "Report on Formal Training" Prof. Cyril Burt wrote:

A common element is more likely to be usable if the learner becomes clearly conscious of its nature and of its general applicability; active or deliberate transfer is far more effective and frequent than passive, automatic or unintentional transfer. This seems especially true when the common element is an element of method rather than of material, an ideal rather than a piece of information.

And Prof. F. A. Cavenagh wrote:

It thus appears that this transfer exists, and that it can cut both ways. If education consists in "what remains after we have forgotten all we learnt" it may be no more than a dislike and contempt for any serious mental pursuit, for anything "high-brow." On the other hand, it may mean activity of mind and the capacity for finding interest in any task, and for constantly increasing the circle of one's interests.

he likes discussing its philosophy, the more likely he is to retain and transfer it. Thus, to return to our examples, a student who develops a delight in accurate weighing, making accuracy almost a minor ideal, may well carry the techniques and attitude of seeking accuracy far and wide in his activities, particularly if he has been made aware of the possibility and value of this wide transfer. The student who develops skill in geometrical argument and feels inspired by the method may well become the clearer lawyer or cleverer economist by the transfer of some of that training.

IV. It has been suggested that ease and amount of transfer increase with increasing general intelligence. This seems reasonable in the light of the other requirements. If this is true, the brightest students should profit most from courses in general education.

We now return with gravely increased doubts to the orthodox science course, in which the student is carried through topic after topic, learning things for examination purposes, without much time to consider or discuss or even to think about the nature of science. He does not develop an ideal of being scientific. The discipline of a physics course crammed with facts and principles, derivations and problems, may teach him physics but it offers poor hopes of transfer. So those of us who want to give students an appreciation of science, as well as some knowledge of it, seek courses in which we cover less material and have more time for other uses in the course. If students are to learn about scientific method they will need more time to study the harder parts of the content carefully so that they understand what they learn—a headache over difficult material treated too fast would be a poor basis for transfer. There must be time for student discussion, for careful reading and clear teaching, for historical analysis, for arguments and for expositions of the nature of science; above all time for students to turn around often and look back on the way they have traveled, trying to understand what it is all about instead of merely knowing facts or rules soon to be forgotten.

THE NEW COURSES

Realistic Aims. Turning the comments on transfer towards our aims for new courses, we again meet doubts. We doubt if we can cultivate general abilities or "train the mind." We doubt if we can give a complete conspectus of the basic principles of the physical and biological world, their implications for human welfare, and their influence on the development of thought and institutions, except a short-lived one that fades after the examination. We doubt if we can train critical thinkers—at best we can encourage critical thinking and hope for some transfer, if we plan for it. We are even doubtful about training

students in scientific method with serious hopes of transfer; this seems to be asking too much. However, by leading them through a variety of scientific methods we may give them an appreciation of science which will transfer. Aims such as making students understand what science is like, and what scientists are like,⁴ are more realizable, we believe, and many of us would be well satisfied with moderate success in these alone. Thinking of transfer from classroom to later life, we are tempted to transpose the word *like* in these aims and say, "to make students like science, and like scientists." If they do not enjoy their acquaintance, it is likely to be a brief one.

Content. The new courses should mediate between the layman and the scientist, between a classical culture and a scientific civilization. They cannot do this just by pouring in scientific information or formal training. They must try to give a sympathetic understanding of science and the way scientific work is done. To make this understanding a lasting part of people's culture is a huge task. In a one-year course we can give only glimpses of it; and to do so will mean omitting at least half the orthodox course content.

We need have no fear that the new courses will lose all content and become easy talks about science. To achieve our aims we must deal with solid scientific material. Though we remove half the topics of an orthodox course, students may learn more rather than less in studying the rest more carefully, and may remember more material some time after the course. We can choose the material we keep and tie it together in such a way that they really have a chance to learn what science is like—and to like it. With an understanding of the nature of science they should be able to look up facts in books and they are likely to retain a lifelong interest in scientific reading.

THE BLOCK-AND-GAP SCHEME

In the conferences, we found a common element in all our schemes for new courses: the reduction of content to a smaller number of topics which are to be treated carefully as samples of scientific work.

To make discussion of schemes easier, I suggest the descriptions and names shown in Fig. 1 for various types of science courses. Let us represent the field of scientific knowledge by a table ABCDD'C'B'A', containing a vertical column for each science. (For example BCC'B' represents physics. I shall use physics as my example but another science would do just as well.)

The orthodox courses, labeled alpha and beta, proceed straight down a column, covering subject matter as thoroughly as time and the students' preparation

⁴In their work and in its effect on other people, not in their personal lives.

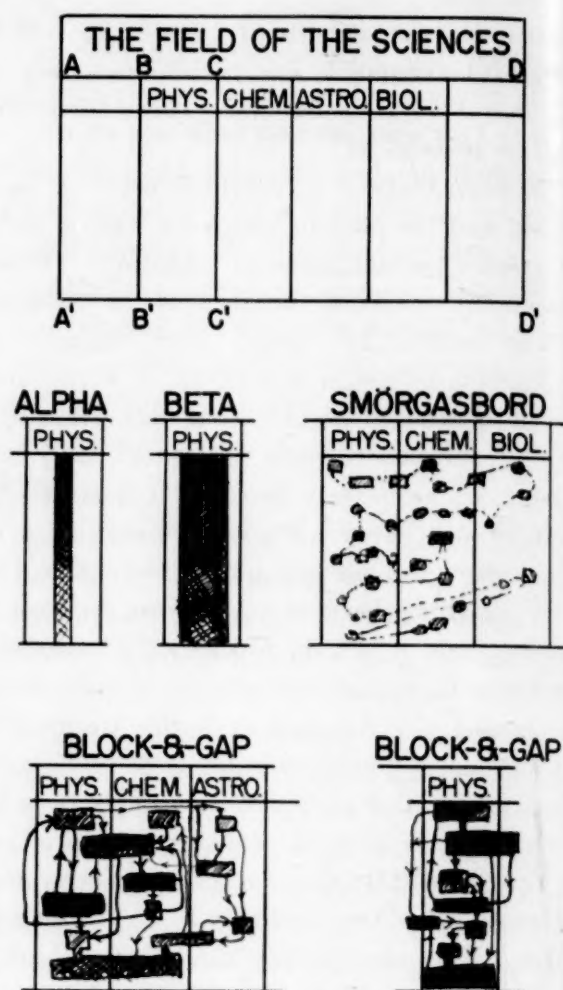


FIG. 1. Subject matter in science courses.

permit, usually trying to lay a foundation for later courses. Some colleges offer several such courses for students with different preparation or interests. Of these, beta is a standard freshman course. All the important topics are treated in turn, often with little time to show their consequences or their interrelations. History may be mentioned but it is not discussed and certainly not brought to life. Beta is well packed with content. (In physics courses of this kind, problem-solving involves many arithmetical substitutions but contains some algebraic argument and derivations.)

Alpha is a "thin" or easy course which begins at the beginning and mentions topics thoroughly but avoids the hard parts of the treatment. (In physics, such courses are often recommended for students who have not studied physics before, and they are sought by many premedical students. They seem hard enough to their customers, but to their instructors they often seem too easy and too dull. In tests, easy numerical problems are more common than derivations involving argument. The student's real understanding is not inquired into.)

To meet the needs of general education, some have suggested and tried a survey course running all over the field of several sciences, mentioning as many topics as it can. Some people believe this kind of course gives the student valuable acquaintance with the sci-

ences. Most of us condemn it as giving a useless smattering of facts with no time for discussion or real understanding. We can draw a tenuous line connecting the topics, but such continuity has little educational value. I have labeled this the "smörgåsbord course." (The title "survey course" is easily misunderstood.) It is doubtful if this wild rush through many topics meets the needs of general education. Besides being too superficial, it makes science seem a glamorous wonderland of facts and names, announced by the wizard-scientist—a damaging piece of negative teaching.

Putting into a diagram our prescription of less subject matter treated more carefully, I have sketched a scheme which I call a block-and-gap course. The blocks represent the chosen topics. They are taught thoroughly (so that the blocks are *dense*) and their background is explored (so that the blocks are *extensive*). Connecting the blocks are discussion lines along which flows the lifeblood of the course: historical studies, arguments about experiment and theory, ideas and information carried from one block to another, and thence, enriched, to still another or back to the first one—showing the organic structure of science. The gaps are essential; they reduce the content of the course so that there is time for discussion, time to see interrelationships, time for ideas to sink in, and time for the student to look back and reconsider.

Blocks may be chosen from a single science or from several sciences. In working practice, these two kinds of block-and-gap course do not differ greatly. There are those who insist that the methods of the different sciences differ so greatly that we should take samples from all sciences. But in a one-year course we might lose more by such diversity than we gained.

The block-and-gap scheme is a mere artifice to express general policy. It does not say what blocks should be chosen, nor does it show how they should be treated. Each group of teachers should choose its own set of blocks—the conscious effort involved contributes to the health of the course. Those starting a course would be unwise to copy someone else's choice; very unwise to choose too many blocks and thus return to a beta course.

TREATMENT OF BLOCKS

At the conferences we seemed agreed on the restriction of content to a few blocks, on the insistence that the blocks be treated thoroughly—more thoroughly than in a beta course—and on the importance of discussions, relating the blocks and commenting on them. But over the great question of how the blocks should be treated there was no general agreement. Probably, if we keep our attention fixed on our newly emphasized aims, we may use any treatment that fits the in-

terests of staff and students. The history of the growth of a piece of science makes the science itself seem clearer. So we expect historical treatment to be useful. To some students, scientific work remains unreal unless they try it themselves; so we find laboratory work advocated—without the deadening effect of cookbook instructions. Ordinary teaching methods, such as expounding material and arguments in lectures, can be directed towards our new aims; so we meet pleas for saving time and money by lectures. Here is a list of some of the methods being tried:

Case histories. This is the method suggested by President Conant in his book *On understanding science*. In the hands of well-informed, enthusiastic teachers, this makes a marvelous course for certain kinds of students. Cases from many sciences can be selected, giving a much fairer account of scientific work and thinking than selections from a single science. Many of us believe that students emerge from such a course with a real appreciation and understanding of science. This course uses original writings and accounts of research by great scientists, very fully edited for students and accompanied by notes and reading from ordinary texts. Help is needed from professional historians of science, for editing material and for arranging the course, and it is to be hoped that colleges will establish faculty posts in the history of science for this purpose.

Study of original documents. This is a more extreme method, which encourages students to read original scientific writings very critically. Like the method just described, it needs good translations and reprints, many of them not yet available. Used alone, it is a slow method and probably should be combined with other methods, such as laboratory work.

Courses in the history of science by qualified historians. Excellent in themselves, such courses probably deserve to be preceded by a course in science and are better given in a special department. Conference members doubted that such courses would meet their aims for the general student, but felt they were almost essential in the preparation of future science teachers.

Orthodox presentation. This method makes use of lectures and laboratory work, etc., in the orthodox way, but with a new spirit. It is speedy and clear but lacks a certain needed flavor of genuineness unless combined with some historical treatment. Laboratory work is thought by many to be essential but it is costly and requires instructors who will be patient and silent and refrain from urging students to "get the right answer." The business of the laboratory is to give students close contact with scientific work, to make them aware of its difficulties, as well as its delights.

The same sense of reality may come from careful study of case histories, so in that course laboratory may be unnecessary—the laboratories of great scientists are brought into the students' library.

TEACHERS

What teachers are needed for such courses? Ideally we need a group trained in several sciences and in the history of science and in philosophy, people with special interests, perhaps with special teaching skills. Actually we find we can do well enough with a group of teachers picked from the usual science faculty, picked for their sympathetic interest in such courses. With the will to make the course succeed, young teachers learn in a few months to run classes and laboratories. Frequent staff conferences are needed, but then the discussions are far more interesting than routine staff meetings of a beta or alpha course. Out of the new courses themselves will come teachers for the next generation of new courses. For these new teachers we can advocate training in the history of science and in philosophy as well as orthodox subject matter in several sciences.

INTEGRITY

However the blocks and gaps are treated, we need all through the course a certain quality of intentness and relevancy. We need to be intent on the future of the course and on the past. Each block, reasonably complete in itself, must fit with other blocks, both use them and be useful to them in showing the structure of science. We should be intent on showing the growth of science from empirical knowledge extracted

inductively to knowledge built into a structure of theory tested by experiment. We should make sure that reading and laboratory work and examination questions are relevant, above all in their attitude. We must aim directly at our goals, so that students can see and appreciate them.

Consider the teaching of scientific method as an example. Simply listing "method" in our program does not assure success. Routine drill in scientific procedure will do little good. Preaching at students a unique scientific method (devised by Francis Bacon) gives a stultified picture of scientific procedure which they may rightly reject as unreal. We should do better to have them find that science uses a variety of apparatus and techniques and then see that a problem can be investigated from several points of view—thus finding, in these senses, many scientific methods. Finally we may be able to show there is a single underlying method: the way in which scientists build up a sense of assurance or validity about scientific results as they proceed from empirical knowledge towards established theory. If we aim intently at these stages of understanding we may carry students with us.

I call this essential quality of intentness and relevance *integrity*, (with a slight flavor of integration). Each item in the course must be true to itself and true to the rest of the course and its aims. Without integrity, a block-and-gap course, run carelessly with a patchy mixture of topics, will be a failure—a tepid cafeteria meal. With integrity, we believe the new courses can do great things and are already succeeding in some measure, so that their students will maintain the good name of science.



Preview of the 116th Meeting, AAAS

New York City, December 26-31, 1949

General Information

Seventy-nine Association sections, affiliated and associated societies, and several guest organizations will present programs at the Sixth New York Meeting. Although in this respect it will be the largest convention in the Association's 101-year history, it will also be one of the most convenient. Nearly all the sessions are closely grouped in the hotels of New York's "Pennsylvania Zone." Related societies have headquarters in the same hotel, and the integrity of each society's sessions is assured. All of the hotels—the Statler, New Yorker, McAlpin, Governor Clinton, and Martinique—are within two blocks of the Pennsylvania Station and each other.

For those societies that prefer meeting in academic classrooms or laboratories, sessions are scheduled at Columbia University, only 15-20 minutes distant on the RT Broadway-Seventh Avenue subway. The Biologists' Smoker is at the American Museum of Natural History, a short ride on the Eighth Avenue subway. The administrative officers of the AAAS believe that both the advantages of individual meetings and the many advantages of a large diversified meeting will be realized.

Space arrangements for the meeting were made possible by the cooperation of the New York Convention and Visitors Bureau, the sales managers of the hotels mentioned, and the administrators of Columbia University and the American Museum of Natural History. The Manhattan Center (next door to the New Yorker) was engaged by the American Sociological Society for its daytime sessions, but in no other instance was it necessary to pay for meeting rooms. The Association is further indebted to the New York Convention and Visitors Bureau for the aid of its experienced housing bureau and will use its professionally trained registration personnel at nominal expense. Commitments for a block of 500 sleeper rooms with accommodations for nearly twice that number of people were made by the Penn Zone hotels. Confirmations have been made promptly, often within a week. Except for the usual heavy demand for single rooms, there are plenty of hotel rooms available; if necessary, additional hotels near the Penn Zone can be utilized.

At this writing, there has been no exact count of papers to be read, but it exceeds 2,000. The General Program of more than 300 pages has already been mailed to those who registered in advance—between four and five times as many as the advance registrants at the Chicago Meeting of 1947. There is still time to register in advance if communications are received in Washington by 5:00 p.m., December 12; please see the coupon in this issue. After that date, please register upon arrival. There will be registration facilities in each hotel, open daily from 8:30 a.m. to 6:00 p.m. The Main Registration-Information Center, on the 18th floor of the Hotel Statler—where

the Visible Directory of Registrants, the AAAS New Member Service, the AAAS Science Theater, and the Annual Science Exposition will also be located—will be open each evening until 9:00 p.m. The Main Registration-Information Center is the only source for supplementary literature, including 1) a free map and directory of points of interest in New York City, 2) special announcements, 3) descriptions of tours, 4) discounted tour tickets to the Empire State Building Observatory, Radio City, etc., 5) free radio broadcast tickets, and the like. Registrants should call for these at their convenience. Each advance registrant should bring his General Program (since another cannot be furnished), his registration receipt, and his convention badge to the Meeting.

This year, the Association no longer is urging society officers to have their session chairmen attempt to make registration mandatory, for this is awkward and inconvenient. Yet it is hoped that each person who attends the 116th Meeting, or any session of it, will realize that the AAAS registration fee—\$2.00 for members, \$3.00 for nonmembers—intentionally has been kept low to encourage attendance, especially by science teachers and students, and these fees are absolutely necessary to pay for the general expenses of the Meeting. The great majority of the participating societies have voted for the plan whereby the AAAS assists each society with its projection costs according to a formula based upon the average percentage of registrants at a society's sessions and the average percentage of AAAS membership. (Society A, with 90 percent registrants at its sessions, and 90 percent of its membership also members of the Association, will have 90 percent of its projection costs paid by the AAAS; Society B, with 50 percent registrants at its sessions, and 10 percent of its membership also members of the Association, will still have 30 percent of its projection costs paid for by the AAAS.) Thus, each person who registers helps his own society. Presiding officers at sessions have the responsibility of estimating the percentage of nonregistrants, and so each registrant should wear his badge.

The following events are open only to registrants: The AAAS Reception, the AAAS Science Theater, the Biologists' Smoker (by an overwhelming vote of the biological societies), and free admission to the Museum of Modern Art and the D'Oyly Carte film production of *The Mikado*.

Reservations for hotel rooms may be made until almost the last day—please see the hotel reservation coupon in this issue. Telegrams or telephone calls are advisable after December 18. Those who do not make advance reservations, and find accommodations exhausted at a particular hotel, will be given help in finding a room—either by the desk clerk or by the Association's Information Center.

General Headquarters

The Hotel Statler (formerly the Hotel Pennsylvania), just across Seventh Avenue from Pennsylvania Station, is the official Headquarters of the AAAS; it is where the Council of the Association will meet. The Press Rooms are located on the South Mezzanine: Press Releases and Authors' Abstracts, Conference Room No. 7; Radio and Television arrangements, Local Publicity Committee, Conference Room No. 8. The Main Registration, Information Center, Visible Directory of Registrants, New Member Service, the Annual Science Exposition, International Photography-in-Science Salon, and the Science Theater, with its almost continuous showing of the latest scientific films, are all in the Penn Top of the Hotel Statler. The Penn Top is readily reached by express elevators.

Headquarters of the Sections of the AAAS and the Participating Societies

Hotel Statler (Seventh Avenue between 32nd and 33rd Streets): AAAS Sections B, C, F, M, N, Nm, Np; zoological societies, viz., American Society of Parasitologists, American Society of Protozoologists, American Society of Zoologists, Society of Systematic Zoology; American Microscopical Society, American Society of Naturalists; Newark College of Engineering; American Dietetic Association; Beta Beta Beta; National Association of Science Writers; National Geographic Society; Scientific Research Society of America; Sigma Delta Epsilon; Society of the Sigma Xi.

Hotel New Yorker (Eighth Avenue between 34th and 35th Streets): AAAS Sections E, H, I, L, Q; American Geographical Society of New York, Association of American Geographers, Geological Society of America; AAAS Cooperative Committee on Teaching of Science and Mathematics; the science teaching societies, viz., American Nature Study Society, National Association of Biology Teachers, National Council of Teachers of Mathematics, National Science Teachers Association, Federation of Science Teachers Associations of New York City, Society for Research in Child Development; Alpha Kappa Delta, American Farm Economic Association, American Sociological Society, Rural Sociological Society; American Philosophical Association, Philosophy of Science Association.

Manhattan Center (34th Street, next to Hotel New Yorker): Meeting rooms for the morning and afternoon sessions of the American Sociological Society.

Hotel McAlpin (Broadway [Avenue of the Americas] between 33rd and 34th Streets): AAAS Sections G, Nd, O; the plant science societies, viz., American Bryological Society, American Fern Society, American Society of Plant Physiologists, American Society of Plant Taxonomists, Botanical Society of America, Mycological Society of America, Phycological Society of America, Torrey Botanical Club; New York Section, American Institute of Electrical Engineers; American Institute of Biological Sciences.

Hotel Martinique (Broadway and 32nd Street): American Phytopathological Society.

Hotel Governor Clinton (Seventh Avenue and 31st

Street): AAAS Sections A, D, K; American Mathematical Society, Institute of Mathematical Statistics, Mathematical Association of America; American Society of Human Genetics, American Society of Limnology and Oceanography, Biometric Society, Ecological Society of America, Genetics Society of America, Society for the Study of Evolution; Academy of World Economics; Metric Association; Alpha Epsilon Delta; Phi Kappa Phi; Pi Gamma Mu.

Registration

Main Registration and Information. The Main Registration and Information Center is located in the main corridor of the 18th floor of the Hotel Statler, which is quickly reached by express elevators to the Penn Top (marked 10-18). It is open from 8:30 a.m. to 9:00 p.m. daily from Monday, December 26, till Saturday, December 31, when it closes at noon. Badges and General Programs may also be obtained at all other registration desks, but the Main Registration is the *only* place where supplementary literature, free maps of the city, broadcast tickets, specially discounted tour tickets, etc., are available to registrants. *Advance registrants*, who received their programs and badges prior to the meeting, and those who register in their own headquarters hotels, are urged to visit the Main Registration at any convenient time to receive these items.

Supplementary Registration Desks. For the convenience of those attending the 116th Meeting there are supplementary registration desks in all the Penn Zone hotels, open 8:30 a.m. to 6:00 p.m. daily, Monday, December 26, through Friday, December 30, located as follows: Hotel Statler—first mezzanine (opposite front entrance). Hotel New Yorker—mezzanine. Hotel McAlpin—first mezzanine. Hotel Martinique—mezzanine. Hotel Governor Clinton—main lobby.

On the evening of Thursday, December 29, upon the occasion of the Biologists' Smoker, 9:00 p.m. till midnight, there will be special registration facilities at the American Museum of Natural History—since this event is open only to registrants.

Registration Fee. The registration fee is \$2.00 for members of the AAAS, for *bona fide* students, and for a wife or husband of a registrant; it is \$3.00 for all others. Each registrant receives a receipt, a Convention Badge, and the General Program—the only publication containing the programs of all the 16 AAAS sections and the 63 participating societies.

Society Meal Function Tickets. In general, tickets to the dinners, luncheons, or breakfasts of any society are obtainable only from representatives of that society and during the preceding sessions of the society. Any society, however, has the privilege of the use of an AAAS Supplementary Registration desk to serve as a ticket booth, provided that that portion is manned by a representative of the society. Experience has shown that it is much more satisfactory to all concerned for each organized meal function to be the responsibility of the society that sponsors it.

Visible Directory of Registrants. The Visible Directory is located in the Salle Moderne on the 18th floor of the Hotel Statler—quickly reached by express elevators to the Penn Top. It will be open at all times except from late in the evening till 8:30 a.m. During the hours when the Annual Science Exposition is open, the Salle Moderne is entered from the Penn Top because of the need for traffic to move in one direction. The registration cards of all registrants are placed in the Visible Directory as soon as possible after registration. The arrangement is alphabetical. The cards of advance registrants are alphabetized to the second or third letter of the surname, since they were posted in Washington prior to the meeting. All other registration cards are filed only by the initial letter of the surname (thus Thorp may precede Tate, etc.). Registrants will find the Visible Directory invaluable in determining the convention addresses of friends attending the Meeting.

Mail, Telegrams, and Messages. Mail and telegrams addressed in care of the AAAS will be held at the AAAS Office on the 18th floor of the Hotel Statler. Every effort will be made to notify addressees listed in the Visible Directory, but the Association assumes no responsibility for the delivery of mail or telegrams.

Telephone and personal messages will be filed alphabetically in the AAAS Office on the 18th floor of the Statler.

Points of Special Interest—Tours, etc.

The map and directory of New York—available to all registrants and distributed only from the Main Registration-Information Center, 18th floor, Hotel Statler—displays and lists all principal points of interest on Manhattan Island.

In addition to the map and directory, a limited number of copies of "Let's Go and See," a leaflet giving information about all museums, botanic gardens, etc., in New York City, will be available at the Main Registration-Information Center. While each of these institutions will welcome visitors, those listed below have made special arrangements for AAAS delegates, members of their families, and guests.

The Metropolitan Museum of Art (Fifth Avenue at 82nd Street). On Wednesday, December 28, the entire museum will remain open until 6:30 p.m. especially for AAAS guests. No admission charge.

Museum of Modern Art (11 West 53rd Street). In addition to permanent collection, works of Paul Klee are on exhibition. Color film: *The Mikado*, produced by the D'Oyly Carte Company. Hours, 12:00 noon–7:00 p.m.; films shown at 3:00 and 5:30 p.m.

Museum of the City of New York (Fifth Avenue at 103rd Street). Hours, Tuesday through Saturday, 10:00 a.m.–5:00 p.m. The exhibit, "A Hospital Bed," which traces the growth of hospitals in New York City, will be of particular interest to medical scientists. An electron microscope will be operated at special times for AAAS delegates.

American Museum of Natural History (79th Street and Central Park West). A cordial invitation is extended to all attending the AAAS Meeting to visit the American

Museum of Natural History, not only upon the occasion of the Biologists' Smoker, Thursday evening, December 29, 9:00 p.m. till midnight, but throughout the week. Hours: Sundays and Monday, December 26, 1:00 p.m. to 5:00 p.m.; other days, 10:00 a.m. to 5:00 p.m.

New York Zoological Society. Open house on December 26, 27, 28, and 29. Guided tours leave the Administration Building at 2:00 p.m.—return at 4:00 p.m. for tea. (See Local Travel Directions for how to get there.)

The New York Public Library (Fifth Avenue and 42nd Street). A special exhibit, entitled "Science—Old and New," includes rare early science manuscripts and printed books leading up to recent books and periodicals, is located on the main floor near the Science and Technology Division.

*** The Brooklyn Botanic Garden.** Open House in the virus and tissue culture laboratories at 2:00 p.m., Tuesday, December 27. Conservatories open 10:00 a.m. to 4:00 p.m. weekdays, 2:00 p.m. to 4:00 p.m. Sundays. (Take Seventh Avenue subway to Eastern Parkway-Brooklyn Museum Station.)

*** The Boyce Thompson Institute for Plant Research, Inc., Yonkers, New York.** Open House on Friday afternoon, December 30. The Institute will provide bus transportation (at cost) which will leave the Hotel McAlpin at 1:30 p.m.; and return about 5:30 p.m. Registration for this trip may be made at the Main Registration-Information Center, 18th floor, Hotel Statler, until Friday morning.

INDUSTRIAL ORGANIZATIONS

International Business Machines Corporation. Guided inspection tours of the Selective Sequence Electronic Calculator between 9:15 a.m. and 5:15 p.m. each day of the Convention. At IBM World Headquarters, 590 Madison Avenue.

*** New York Telephone Company.** Bell Telephone Laboratories at 463 West Street, New York. Tuesday, 10:00 a.m., December 27; Wednesday, 2:30 p.m., December 28. One and one half-hour tours each day showing: developments in dial telephone and switch; automatic message accounting; other items in the field of communications development. **Long Lines Department**, 32 Avenue of the Americas (Sixth Avenue), New York. Inspection tours at 10:00 a.m. and 2:30 p.m. on December 27, 28, 29, and 30. One and one half-hour tours showing: long distance operating room; overseas operating room; overseas control office; teletypewriter exchange; radio and television broadcasting networks room.

*** Rockwood & Company** (chocolate manufacturers). Guided inspection tour of their plant at 88 Washington Avenue, Brooklyn, for a group of ten persons at each of the following times: 10:30 a.m. and 2:30 p.m. on December 27 and 28.

*** Consolidated Edison Company of New York.** One-hour tours of the Waterside Station, 708 First Avenue (near the site of the new United Nations Headquarters) at 10:00 a.m. and 2:00 p.m. on December 28 and 29.

* These require advance registration of at least one day—at the Main Registration-Information Center, 18th floor, Hotel Statler.

RADIO AND TELEVISION

National Broadcasting Company, Inc. Reduced tickets for tour of NBC facilities at RCA Building, Radio City, available at Main Registration-Information Center.

WOR (1440 Broadway, New York City). Free tickets for radio and television shows available at the Main Registration-Information Center.

Other radio broadcast tickets will also be available.

COMMERCIAL TOURS

Rockefeller Center Guided Tours, Observation Roof (30 Rockefeller Plaza). Reduced tickets available at Main Registration-Information Center.

Empire State Building, Observatory (Fifth Avenue and 34th Street). Reduced tickets available at Main Registration-Information Center.

Sight-seeing Trips in Motor Coaches. Consult the Information Center for tours to various parts of the city.

TOURS ARRANGED BY THE FEDERATION OF SCIENCE TEACHERS ASSOCIATIONS OF NEW YORK CITY

A series of tours and visits has been arranged. For details consult the Federation's booth in the Hotel New Yorker.

FIELD TRIP

On Friday, December 30, starting at 8:30 a.m., there will be an all-day Field Trip, perhaps to Jones Beach, to study ecology and wintering birds. This trip, sponsored by the American Nature Study Society, will be conducted by Edwin Way Teale, Roger Tory Peterson, Allan D. Cruickshank, Richard H. Pough, E. L. Palmer, and Richard L. Weaver.

Those interested should register, *preferably well in advance*, at Parlor B, Hotel New Yorker, the headquarters room of the Society and point of departure.

Press Service of the Association

All persons who will deliver addresses or present papers at the New York Meeting are requested to provide the Press Service with 100 copies of abstracts of their papers. One hundred copies of *complete* manuscripts are required of papers presented by 1) officers of the Association; 2) officers and invited speakers that appear on the programs of the participating societies; and 3) any author whose paper has a particular news value. In general, most authors already have recognized the necessity for this and will have sent this material to the Association's Press Director, Sidney S. Negus, Medical College of Virginia, Richmond, Virginia, before December 15. If this has not been done, however, please send your abstract and/or complete manuscript to Dr. Negus. Starting December 20, and throughout the meeting period, abstracts and copies of papers should be delivered to Dr. Negus at the *AAAS Press Office, Conference Room No. 7, First Mezzanine, Hotel Statler*. This press room is equipped with typewriters, duplicating machines, bulletin boards, extra telephones, standard references, and special files. Dr. Negus invites all who are interested to call. (But please do not request information or material that is available

at the Information Center and Main Registration in the Penn Top!)

In *The Scientific Monthly* for September, 1949, pp. 156-160, F. Barrows Colton, president of the National Association of Science Writers and a member of the editorial staff of the *National Geographic Magazine*, has an entertaining article "Some of my Best Friends are Scientists." The points of view of the experienced science writer and the researcher, who may be unaware of the public's legitimate interest in his scientific contributions, are contrasted. He says:

It is probably safe to say that science writers understand scientists better than scientists understand science writers. But science writers are so important to science that scientists need to have some knowledge of their working methods and problems.

In the process of writing about science, modern science writers not only are covering the news but are rendering a real service to science as well. . . . They perform an essential and specialized role. . . . [Their] audience, incidentally, includes many scientists who cannot possibly keep up with all developments outside their own fields.

The necessity for the general public to be kept informed of the results of the scientific research which it supports, directly or indirectly, is quite evident. Organized science and the individual scientist must have the understanding and maintenance of all. It is, of course, equally important that the advances of science be publicized with clarity and without sensationalism. The progress in this direction has been gratifying. It is in the interest of accuracy and completeness that science writers frequently wish to discuss points with authors. If biographical information or photographs are requested, each author should recognize in this an obligation to science. Between 120 and 150 science writers are covering this Meeting and all wire services will carry the stories they file—to the entire civilized world. At no other scientific meeting are the facilities for the dissemination of the most recent findings in science so complete as they are at the great, diversified meetings of the AAAS.

This year, not only is the Association fortunate in the continued service of Prof. Negus, immediate past president of the Virginia Academy of Science, but also in its Local Publicity Committee, headed by Robert Harron, director of public information at Columbia, and Hayden Weller, director of press relations, New York University, and composed principally of the experienced directors of publicity of New York's institutions of higher learning. This committee has worked all fall to publicize the 116th Meeting on their own campuses, in magazines, and throughout the city. It has been in sole charge of news reels, radio, and television. The *Radio Press Room in Conference Room No. 8*, on the first mezzanine of the Hotel Statler, will be in operation after December 12.

AAAS Prize Awards

The 22nd award of the AAAS \$1,000 Prize will be made at this New York Meeting to the author of a noteworthy paper presented on a regular program of the meeting and representing an outstanding contribution to science. The generous donor of this award, which is administered

by the Association, has expressed the wish that this prize be awarded to one of the younger scientists and that it shall not be divided among two or more scientists working independently or in collaboration. The prize is awarded upon the recommendation of a special Prize Committee whose judgment shall be final. No award was made in 1948; the winner in 1947 was Harrison S. Brown.

The Prize Committee for the New York meeting consists of George S. Avery, Jr., director, Brooklyn Botanic Garden, *chairman*; Hans T. Clarke, Columbia University, New York City; Lincoln V. Domm, The University of Chicago, Chicago, Illinois; Kirtley F. Mather, Harvard University, Cambridge, Massachusetts; and George B. Pegram, Columbia University, New York City.

It is virtually impossible to determine the relative merits of scientific contributions in wholly different fields, and, of course, not an easy task to single out contributions in any one field of science. The members of each year's Prize Committee must set their own standards for the evaluation of scientific work presented at an annual meeting of the Association. The secretaries of the sections of the AAAS and also of the societies participating are invited to assist the Prize Committee by their preliminary suggestions of one or more papers from the fields they represent for consideration by the Prize Committee.

It is not necessary that the prize winner be a member of the Association. All papers listed in the General Program, except presidential and vice presidential addresses and invited papers, are eligible for the AAAS Prize.

AAAS-George Westinghouse Science Writing Awards. For the past 30 years, a relatively small but increasing group of professional journalists have devoted most or all of their time to the interpretation of developments in science for the lay public. In 1941, the Association recognized the importance of sound reporting of scientific news by accepting as an affiliate the National Association of Science Writers, organized in 1934 in Washington, D. C. In 1945, in the belief that special recognition and encouragement should be given to those writers who have the grave responsibility of making science near and real to the layman, the Westinghouse Educational Foundation and the American Association for the Advancement of Science began the joint sponsorship of the AAAS-George Westinghouse Science Writing Awards. In that year a certificate was given. In 1946 the plan provided for an annual \$1,000 prize for newspaper writing, and, in 1947, it was decided to include a similar award for science reporting in magazines of general circulation. The Foundation provides the funds for the administration of the program, and the AAAS administers the awards through a Managing Committee, appointed by the Association's Executive Committee. The Managing Committee for 1949 consists of Howard A. Meyerhoff, *chairman*; Roger Adams, President Elect of the Association; James A. Baubie, public relations director, Westinghouse Electric Corporation; Frank Carey, science writer, Associated Press; Watson Davis, director, Science Service; Charles N. Fry, publicity department, Westinghouse Electric Corporation; Morris

Meister, principal, Bronx High School of Science; and Sidney S. Negus, AAAS Press Director, Medical College of Virginia.

The awards will be made on the recommendations of the 1949 Judging Committee, the members of which are: Henry R. Aldrich, secretary, Geological Society of America; Detlev Bronk, president, The Johns Hopkins University; Kent Cooper, executive director, Associated Press; John R. Dunning, Department of Physics, Columbia University; Clifton Fadiman, Book-of-the-Month Club; Rudolf Flesch, writer; and Edward Weeks, editor, *The Atlantic Monthly*. Dr. Meister is chairman of this committee.

Prize winners in 1948 were Frank Carey, for newspapers, and Florence Moog, for magazines.

Presentation of the 1949 awards will be made at a luncheon in the Keystone Room of the Hotel Statler, at 1:00 p.m., on Wednesday, December 28. Dr. Elvin C. Stakman, President of the AAAS, will be the guest speaker. Admission is by invitation only.

Annual International Photography-in-Science Salon—on exhibition in the Salle Moderne, 18th floor of the Hotel Statler. Prize winners in the Third International Photography-in-Science Salon, an annual competition for scientists and photographers, sponsored by *The Scientific Monthly* and the Smithsonian Institution, were announced on September 25, 1949.

Judges were Merle A. Tuve, Carnegie Institution, for the physical sciences; Walter F. Jeffers, Department of Botany, University of Maryland, for the biological sciences; A. A. Teeter, Charles Pfizer & Company, New York City, for chemistry; Emanuel Krimsky, Polyclinic Hospital, New York City, for the medical sciences; and Alexander J. Wedderburn, Graphic Arts Division, Smithsonian Institution, for photography.

The 175 prints, which were on exhibition at the U. S. National Museum, October 3-31, will be on view at the 1949 AAAS Annual Meeting. Afterwards the show will go on a tour of important museums and scientific institutions in this country and abroad.

Prize winners in the Black-and-White Division:

First: L. L. Marton, chief, Electron Physics Section, National Bureau of Standards, Washington, D. C.: "Electron-optical shadow method."

Second: Bernard Henry Mollberg, University of Houston, Houston, Texas: "Ventrosinistral view of dried chick embryo, plated with aluminum."

Third: S. B. Newman, Emil Borysko, and Max Swerdlow, National Bureau of Standards, Washington, D. C.: "Electron micrograph of thin section of cells in onion root tip."

Honorable Mention: José Oiticica, Jr., Rio de Janeiro, Brazil (Guggenheim Fellow at the U. S. National Museum, Washington, D. C.): "Male genitalia, ventral view, of *Citheronia mogya* Schaus 1920 (Lepidoptera, Citheroniinae)."

Clyde T. Holliday, Applied Physics Laboratory, The Johns Hopkins University, Silver Spring, Maryland: "Cloud formations." (Photograph made from a V-2 rocket at White Sands Proving Ground.)

T. G. Rochow, American Cyanamid Company, Stamford, Connecticut: "Commerical sample, tri-sodium orthophosphate ('TSP')."

Charles J. Salat, Armour Research Foundation, Chicago, Illinois: "Calibration of a ball bearing by means of optical flats."

Clee O. Worden, Laboratory of C. A. Zapffe, Baltimore, Maryland: "Fraetograph of piezoelectric single crystal."

In the Color Division, the following won awards:

First: Charles D. Oughton and Eugene C. Ricker, Battelle Memorial Institute, Columbus, Ohio: "Xerographic developing process."

Second: Chester F. Reather, Carnegie Institution, Baltimore, Maryland: "Implantation of twelve-day human ovum."

Third: Thomas C. Poulter (third-time prize winner) and Walter Lawton, Stanford Research Institute, Stanford, California: "High-speed movies of colored meteorological balloons used with Poulter Seismic Method show interaction of shock waves in the third dimension."

Honorable Mention: D. H. Rowland, Carnegie-Illinois Steel Corporation Research Laboratory, Pittsburgh, Pennsylvania: "Polished and etched cross section of experimental galvanized coating on low carbon steel."

Rowland B. Stradling, U. S. Cast Iron Pipe and Foundry Company, East Burlington, New Jersey: "Photomicrograph at 200 diameters of titanium nitride in cast iron."

Albert C. Walker, Bell Telephone Laboratories, Murray Hill, New Jersey: "Quartz crystal grown at Bell Telephone Laboratories."

Established to encourage and extend the use of photography as a basic research tool, the contest will be continued in 1950. All entrants shall be actively engaged in scientific research, and all photographs must be taken for scientific purposes. Entries should be sent to the Editor, *The Scientific Monthly*, 1515 Massachusetts Avenue, N. W., Washington 5, D. C., November 1-27, 1950. Prize winners and other accepted entries will be shown at the Annual Meeting of the AAAS in Cleveland, Ohio, December 26-31, 1950, and at the U. S. National Museum, Washington, D. C., January 3-31, 1951.

Dates for showing the 1949 pictures may be arranged by writing to the Editor of *The Scientific Monthly*.

Theobald Smith Award in Medical Sciences. After a lapse of five years, owing to the war, the Theobald Smith Award in Medical Sciences, established in 1936 by Eli Lilly and Company, will again be given at the Annual Meeting of the AAAS.

The Award Committee this year, appointed by Gordon K. Moe, Secretary of Section N, consists of Malcolm H. Soule, University of Michigan, *chairman*, Maurice B. Visscher, University of Minnesota; Louis S. Goodman, University of Utah Medical School; and William B. Castle, City Hospital, Boston.

The award consists of \$1,000 and a bronze medal, given for "demonstrated research in the field of the medical sciences, taking into consideration independence of thought and originality." An additional amount of

\$150 is available toward traveling expenses. The recipient must be less than 35 years of age on January 1 of the year in which the award is to be made, and a citizen of the United States.

Past recipients are: Robley D. Evans, Charles F. Code, Albert B. Sabin, Herald R. Cox, and Sidney C. Madden.

AAAS Business Sessions

The *Executive Committee* of the Association will meet for luncheon and a business session in the Administrative Secretary's suite at the Hotel Statler at noon on Tuesday, December 27. Dates and hours of subsequent sessions of the Executive Committee during the New York Meeting will be decided at this first meeting.

Two sessions of the *Council* of the Association are scheduled at the New York Meeting. The first will be held at 4:00 p.m. Tuesday, December 27, in Parlor 2, Hotel Statler; the second will take place in the same room at 4:30 p.m. Thursday, December 29.

The Council is the governing body of the Association. Although the actual transaction of AAAS business is entrusted to the Executive Committee of the Council, the Constitution stipulates that "Control of all affairs of the Association is vested in the Council, which shall have power to review and to amend or rescind its own actions and all actions taken by the Executive Committee or by other agents to whom powers are delegated by this Constitution or shall have been delegated by the Council. The Council shall enact such bylaws as it may deem desirable, each of which shall remain in force until amended or rescinded by action of the Council."

Because of the large number of affiliated societies participating in the New York Meeting, a record attendance is expected at both sessions of the Council. For this reason several important items of business have been placed on the agenda, among them:

1. Election of the President Elect for 1950.

2. Election of three members of the Executive Committee of the Council, two to succeed C. F. Kettering and Fernandus Payne, whose four-year terms end this year, and one to complete the unexpired term of Roger Adams, whose election to the Presidency of the Association has made him an *ex officio* member of the Executive Committee.

3. Method of nomination and election of the President Elect and Executive Committee members.

4. Revision of Bylaws of the Association (report of Committee, K. F. Mather, *chairman*).

5. Report on Council vote on

- a. Retention of membership grades of Member and Fellow.

- b. Starring of scientists in *American men of science*.

- c. Type of Association meetings.

6. Reports on Association affairs:

- a. Report from the Treasurer, W. E. Wrather.

- b. Reports from Committees: Cooperative Committee on science teaching (K. Lark-Horovitz, *chairman*); Committee on Affiliation and Association (M. H. Soule, *chairman*); Publica-

tions Committee (E. C. Stakman, *chairman*); Editorial Board (H. A. Meyerhoff, *chairman*).

7. New business. Members of the Council are requested to communicate new items of business that should be placed on the agenda to Howard Meyerhoff, Administrative Secretary, not later than December 19.

The Academy Conference will hold a session Friday morning, December 30, at 10:00 a.m. in Parlor A, Hotel New Yorker, and a second session Friday afternoon, at 2:30 p.m., in the same room. At the afternoon session there will be exhibits by high school students, including the prize winners of scholarships awarded by the International Business Machines Corporation. In the evening, the Academy Conference Dinner is scheduled at 6:00 p.m., the place to be announced. The speaker will be William G. Pollard, and his subject: "The Oak Ridge Institute for Nuclear Studies and the Atomic Energy Program in the Associated Universities."

The Inter-Society for a National Science Foundation will hold an open meeting on Tuesday morning, December 27, in the Keystone Room, Hotel Statler, at 10:30 a.m.

Local Committees

A complete list of AAAS Local Committees was printed in *Science* on November 4, p. 486 it will not be repeated here. The Honorary Reception Committee, headed by Governor Thomas E. Dewey and Mayor William O'Dwyer, includes some 80 heads of New York's institutions of higher learning, medical and technical schools, academies, institutes and foundations scientific in character, museums and local technical and scientific societies.

The Program

Full details of the individual programs of the 79 sections and participating organizations are in the General Program, now available to advance registrants. The Special Sessions and AAAS-sponsored Symposia appeared in *Science* on November 18, pp. 536 ff.; the program of the AAAS Science Theatre in *Science* for November 25, pp. 571 ff.

A synopsis of the program sessions, by days, follows:

Monday Afternoon, December 26

AAAS as a Whole

The AAAS Science Theatre, 18th floor, Statler, has its first showing at 2:00 p.m. (open only to registrants).

Annual Science Exposition, Penn Top and adjoining Salle Moderne, Statler, opens at 2:00 p.m.; closes at 6:00 p.m.

Anthropology

H¹ Section on Anthropology—2:30 p.m.; Session, Social Anthropology; Parlors F-G, New Yorker.

Monday Evening, December 26

AAAS as a Whole

Illustrated Public Lecture on Recent Advances in Nu-

¹The key symbols in boldface preceding each event refer to the AAAS Sections and participating societies, as listed in the INDEX OF PROGRAMS near the front of the General Program, and as repeated in the detailed SECTION AND SOCIETY PROGRAMS—the main portion of this book. These programs should be consulted for speakers and titles of papers.

clear Physics—8:00 p.m.; auspices of Scientific Research Society of America; Grand Ballroom, Statler.

Botanical Sciences

G4 American Society of Plant Physiologists—7:00 p.m.; Executive Committee Meeting; Parlor E, McAlpin.

G6 Botanical Society of America—8:00 p.m.; Council Meeting of Society; Room F, McAlpin.

Science in General

X5 Scientific Research Society of America—4:00 p.m.; Meeting of Governing Board; Parlor A, Statler. 5:00 p.m.; General Convention of Society; Parlor A, Statler. 8:00 p.m.; Illustrated Public Lecture on Recent Advances in Nuclear Physics; Grand Ballroom, Statler.

Tuesday Morning, December 27

AAAS as a Whole

Q, H, I, K, and N—9:00 a.m.; Symposium on Meeting the Needs of School Children; North Ballroom, New Yorker.

AAAS Cooperative Committee—10:00 a.m.; Symposium on Trends in Modern Science; Grand Ballroom, New Yorker.

Inter-Society Committee for a National Science Foundation—10:30 a.m.; Open Meeting; Keystone Room, Statler.

Mathematics

A1 American Mathematical Society—10:00 a.m.; Concurrent Session 1; Room 301, Pupin Laboratories. 10:00 a.m.; Concurrent Session 2; Room 329, Pupin Laboratories.

A2 Institute of Mathematical Statistics—9:00 a.m.; Session I-1, joint Session with the American Statistical Association; Governor Room, Governor Clinton.

Zoological Sciences

F1 American Society of Parasitologists—9:00 a.m.; Session; Georgian Room, Statler.

Zoological and Botanical Sciences

FG 10 National Association of Biology Teachers—8:00 a.m.; Executive Board Meeting; Parlor D, New Yorker.

FG 11 Society for the Study of Evolution—11:00 a.m.; Council Meeting; John Jay Dining Hall, Columbia.

Botanical Sciences

G1 American Bryological Society—8:00 a.m.; Breakfast Meeting; Marine Grill, McAlpin. 9:00 a.m.; Business Meeting; El Patio, McAlpin. 10:00 a.m.; Session; El Patio, McAlpin.

G3 American Phytopathological Society—9:30 a.m.; Council Meeting; West Room, Martinique.

G4 American Society of Plant Physiologists—9:00 a.m.; Concurrent Session 1, joint session with Physiological Section of Botanical Society of America (Session 5); Winter Garden, McAlpin. 9:00 a.m.; Concurrent Session 2, joint session with Physiological Section of Botanical Society of America (Session 6); Ballroom, McAlpin.

G5 American Society of Plant Taxonomists—9:30 a.m.; Symposium on Phytogeography of South America Part I, joint session with Systematic Section of Botanical Society of America (Session 7); Crystal Room, McAlpin.

G6 Botanical Society of America—9:00 a.m.; Session 1, Business Meeting of Society; Colonial Room, McAlpin. 9:30 a.m.; Concurrent Session 2, General Section; Colonial Room, McAlpin. 9:30 a.m.; Concurrent Session 3, parallel meeting of Microbiological Section and Mycological Society of America; Green Room, McAlpin. 9:30 a.m.; Concurrent Session 4, Paleobotanical Section; East Room, McAlpin. 9:00 a.m.; Concurrent Session 5, joint meeting of Physiological Section and American Society of Plant Physiologists (Session 1); Winter Garden, McAlpin. 9:00 a.m.; Concurrent Session 6, joint meeting of Physiological Section and American Society of Plant Physiologists (Session 2); Ballroom, McAlpin. 9:30 a.m.; Concurrent Session 7, Symposium on Phytogeography of South America, Part I, joint meeting of Systematic Section and American Society of Plant Taxonomists; Crystal Room, McAlpin.

G7 Mycological Society of America—9:00 a.m.; Business Meeting and Session; Blue Room, McAlpin. 9:30 a.m.; Session, parallel meeting of Microbiological Section of Botanical Society of America (Session 3); Green Room, McAlpin.

G8 Phycological Society of America—9:00 a.m.; Session; Room F, McAlpin.

Anthropology

H Section on Anthropology—9:00 a.m.; Symposium on Meeting the Needs of School Children, joint session of Sections H, I, K, N, and Q; North Ballroom, New Yorker. 9:30 a.m.; Symposium on Mind, Culture and Individuality, Part I; Parlors F-G, New Yorker.

Psychology

I Section on Psychology—9:00 a.m.; Symposium on Meeting the Needs of School Children, joint session of Sections I, H, K, N, and Q; North Ballroom, New Yorker. 9:00 a.m.; Session; East Room, New Yorker.

Social and Economic Sciences

K Section on Social and Economic Sciences—9:00 a.m.; Symposium on Meeting the Needs of School Children, joint session of Sections K, H, I, N, and Q; North Ballroom, New Yorker.

K4 American Sociological Society—Executive Committee Meeting; Parlors E-H, New Yorker. (Time not announced.)

K5 American Statistical Association—9:00 a.m.; Joint session with the Institute of Mathematical Statistics; Governor Room, Governor Clinton.

Engineering

M Section on Engineering—9:00 a.m.; Annual Business Meeting of Section; Parlor 1, Statler.

Medical Sciences

N Section on Medical Sciences—9:00 a.m.; Symposium on Meeting the Needs of School Children, joint sessions of Sections N, H, I, K, and Q; North Ballroom, New Yorker.

Education

Q Section on Education—9:00 a.m.; Symposium on Meeting the Needs of School Children, joint session of Sections Q, H, I, K, and N; North Ballroom, New Yorker.

Q1 AAAS Cooperative Committee on Teaching of Science and Mathematics—10:00 a.m.; Symposium on Trends in Modern Science, joint session of all science teaching societies affiliated with the AAAS; Grand Ballroom, New Yorker.

Q2 National Science Teachers Association—8:00 a.m.; Executive Committee Meeting; Parlor C, New Yorker.

Science in General

X1 American Nature Study Society—8:00 a.m.; Meeting of Board of Directors, Officers and Delegates; Parlor B, New Yorker.

X7 The Society of the Sigma Xi—9:00 a.m.; Executive Committee Meeting; Suite of the Society, Statler.

Tuesday Noon and Afternoon, December 27

AAAS as a Whole

Executive Committee—12:00 noon; Luncheon and Meeting; Suite of Administrative Secretary, Statler.

Council Meeting—4:00 p.m.; Parlor 2, Statler.

National Geographic Society—3:00 p.m.; Annual Lecture, Illustrated, sound film in color on Arnhem Land; Grand Ballroom, Statler.

Mathematics

A Section on Mathematics—2:00 p.m.; Address of Retiring Vice President, joint session with American Mathematical Society; Room 301, Pupin Laboratories.

A1 American Mathematical Society—2:00 p.m.; Joint session with Section A; Room 301, Pupin Laboratories. 4:00 p.m.; Tea given by Columbia University; Faculty House.

A4 National Council of Teachers of Mathematics—2:00 p.m.; Session and Demonstration—Working with Glass, joint meeting with National Science Teachers Association; Grand Ballroom, New Yorker.

Geology and Geography

E4 National Geographic Society—3:00 p.m.; Lecture and color-illustrated sound film on Arnhem Land; Grand Ballroom, Statler.

Zoological Sciences

F1 American Society of Parasitologists—2:00 p.m.; Session; Georgian Room, Statler.

F3 American Society of Zoologists—12:00 noon; Executive Committee Meeting; Parlor A, Statler.

Zoological and Botanical Sciences

FG1 American Microscopical Society—1:00 p.m.; Executive Committee Luncheon and Business Meeting; Parlor B, Statler.

FG5 Beta Beta Beta—12:15 p.m.; Luncheon and Convention Address; Oak Room, Martinique. 1:30 p.m.; Business session; Oak Room, Martinique.

FG8 Ecological Society of America—2:00 p.m.; Session on Plant Ecology, joint session with Botanical Society of America; Gold Room, Martinique.

FG10 National Association of Biology Teachers—2:00 p.m.; Teaching Aids from within the Classroom and Laboratory; North Ballroom, New Yorker.

FG11 Society for the Study of Evolution—2:00 p.m.; Session; Room 902, Schermerhorn Hall, Columbia.

Botanical Sciences

G1 American Bryological Society—2:00 p.m.; Symposium on *The Bryologist* and Bryology; El Patio, McAlpin.

G4 American Society of Plant Physiologists—1:30 p.m.; Concurrent Session 1, joint session with Physiological Section of Botanical Society of America (Session 4); Winter Garden, McAlpin. 1:30 p.m.; Concurrent Session 2, joint session with Physiological Section of Botanical Society of America (Session 5); Ballroom, McAlpin.

G5 American Society of Plant Taxonomists—2:00 p.m.; Symposium on the Phytogeography of South America, Part II, joint session with the Systematic Section of Botanical Society of America (Session 6); Crystal Room, McAlpin.

G6 Botanical Society of America—2:00 p.m.; Concurrent Session 1, General Section; Colonial Room, McAlpin. 2:00 p.m.; Concurrent Session 2, joint meeting of Microbiological Section and Mycological Society of America; Green Room, McAlpin. 2:00 p.m.; Concurrent Session 3, Paleobotanical Section; East Room, McAlpin. 1:30 p.m.; Concurrent Session 4, joint meeting of Physiological Section and American Society of Plant Physiologists (Session 1); Winter Garden, McAlpin. 1:30 p.m.; Concurrent Session 5, joint meeting of Physiological Section and American Society of Plant Physiologists (Session 2); Ballroom, McAlpin. 2:00 p.m.; Concurrent Session 6, Symposium on Phytogeography of South America, Part II; Joint meeting of Systematic Section and American Society of Plant Taxonomists; Crystal Room, McAlpin. 2:00 p.m.; Concurrent Session 7, Plant Ecology, joint meeting with the Ecological Society of America; Gold Room, Martinique.

G7 Mycological Society of America—2:00 p.m.; Session on Medical Mycology; Joint meeting with Microbiological Section of Botanical Society of America (Session 2); Green Room, McAlpin.

G8 Phycological Society of America—2:00 p.m.; Session; Room F, McAlpin.

Anthropology

H Section on Anthropology—2:00 p.m.; Symposium on Mind, Culture, and Individuality, Part II; Parlors F-G, New Yorker.

Psychology

I Section on Psychology—2:00 p.m.; Session; East Room, New Yorker.

Social and Economic Sciences

K4 American Sociological Society—2:00 p.m.; Executive Committee Meeting; Parlors E-H, New Yorker.

Medical Sciences

N3 Alpha Epsilon Delta—12:15 p.m.; Luncheon for

all members and others interested in premedical education; Greeley Room, Governor Clinton.

Education

Q Section on Education—2:00 p.m.; Session; Parlor A, New Yorker.

Q2 National Science Teachers Association—2:00 p.m.; Session and Demonstration—Working with Glass, joint meeting with National Council of Teachers of Mathematics; Grand Ballroom, New Yorker.

Science in General

X1 American Nature Study Society—2:00 p.m.; Session, Nature Writing and Nature Books; Panel Room, New Yorker.

X6 Sigma Delta Epsilon—4:30 p.m.; Alumnae member's tea; Parlor C, Statler.

X7 The Society of the Sigma Xi—1:00 p.m.; Executive Committee Meeting; Suite of the Society, Statler. 4:00 p.m.; Annual Convention; Keystone Room, Statler.

Tuesday Evening, December 27

AAAS as a Whole

M and M1 Section on Engineering; and Newark College of Engineering—7:30 p.m.; Symposium on Nuclear Engineering, joint program; Parlor 1, Statler.

Annual Address of the Society of the Sigma Xi—8:00 p.m.; Illustrated Lecture: Evolution in the Tropics; Grand Ballroom, Statler.

Mathematics

A1 American Mathematical Society—8:00 p.m.; Meeting of Organizing Committee of the International Mathematical Congress; Room 4, John Jay Hall.

Zoological Sciences

F1 American Society of Parasitologists—7:00 p.m.; Dinner and Business Meeting of officers and members of Council; Parlor A, Statler.

Zoological and Botanical Sciences

FG 10 National Association of Biology Teachers—7:30 p.m.; Meeting of Board of Directors; Parlor D, New Yorker.

FG 12 American Institute of Biological Sciences—9:30 p.m.; Conference on Uniformity of Literature Citations; Colonial Room, McAlpin.

Botanical Sciences

G4 American Society of Plant Physiologists—7:00 p.m.; Plant Physiologists' Dinner, Presidential Address of Society, Stephen Hales Lecture; Gold Room, Martinique.

G5 American Society of Plant Taxonomists—7:00 p.m.; Annual Meeting and Dinner of Society, Presidential Address; Hunter College.

G6 Botanical Society of America—8:00 p.m.; Council Meeting of Society; Room F, McAlpin.

Psychology

I Section on Psychology—8:00 p.m.; Vice Presidential Addresses of Sections I and Q, joint session; North

Ballroom, New Yorker.

Engineering

M and M1 *Section on Engineering; Newark College of Engineering*—7:30 p.m.; Symposium on Nuclear Engineering, joint program; Parlor 1, Statler.

Medical Sciences

N4 *American Dietetic Association*—8:00 p.m.; Session; Governor Room, Governor Clinton.

Education

Q *Section on Education*—8:00 p.m.; Vice Presidential Addresses of Sections Q and I, joint session; North Ballroom, New Yorker.

Q2 *National Science Teachers Association*—7:30 p.m.; Board of Directors Meeting; Parlors F-G, New Yorker.

Science in General

X1 *American Nature Study Society*—8:00 p.m.; Annual Business Meeting, Informal Showing of Kodachromes; Panel Room, New Yorker.

X7 *The Society of the Sigma Xi*—8:00 p.m.; Illustrated Lecture: Evolution in the Tropics; Grand Ballroom, Statler.

Wednesday Morning, December 28

AAAS as a Whole

AAAS Cooperative Committee on the Teaching of Science and Mathematics—10:00 a.m.; General Session, joint meeting with all science teaching societies; Grand Ballroom, New Yorker.

AAAS Subsection Nm—9:30 a.m.; Symposium on Adrenal Cortex, Part I; Keystone Room, Statler.

Mathematics

A1 *American Mathematical Society*—9:30 a.m.; General Session; Room 301, Pupin Laboratories. 10:45 a.m.; Concurrent Session 1; Room 301, Pupin Laboratories. 10:45 a.m.; Concurrent Session 2; Room 329, Pupin Laboratories.

Zoological Sciences

F1 *American Society of Parasitologists*—9:00 a.m.; Symposium on the Physiology of Parasites; Gold Room, Martinique.

F2 *American Society of Protozoologists*—9:00 a.m.; Business Meeting; Parlor 1, Statler.

F3 *American Society of Zoologists*—9:15 a.m.; Symposium on Experimental Cell Research, joint session with Genetics Society of America; Grand Ballroom, Statler.

Zoological and Botanical Sciences

FG2 *American Society of Human Genetics*—10:00 a.m.; Session; Gramercy Room, Governor Clinton. Demonstrations, all day, Wednesday (and Thursday); Parlors F and J, Governor Clinton.

FG3 *American Society of Limnology and Oceanography*—9:30 a.m.; Special Session on Apparatus and Methods; Room 902, Schermerhorn Hall, Columbia.

FG8 *Ecological Society of America*—9:30 a.m.; Concurrent Session 1, Animal Ecology; Room 502, Kent Hall,

Columbia. 9:30 a.m.; Concurrent Session 2, Plant Ecology; Room 515, Kent Hall.

FG9 *Genetics Society of America*—9:00 a.m.; Concurrent Session 1; Governor Room, Governor Clinton. 9:00 a.m.; Concurrent Session 2; Florentine Room, Governor Clinton. 9:15 a.m.; Concurrent Session 3, Symposium on Experimental Cell Research, joint session with American Society of Zoologists; Grand Ballroom, Statler.

FG10 *National Association of Biology Teachers*—10:00 a.m.; General Session, joint meeting with AAAS Cooperative Committee and all science teaching organizations affiliated with AAAS; Grand Ballroom, New Yorker.

FG11 *Society for the Study of Evolution*—9:00 a.m.; Symposium on the Role of the South Atlantic Basin in Biogeography and Evolution, Part I; Main lecture room, Brander Matthews Hall, Columbia.

Botanical Sciences

G1 *American Bryological Society*—9:30 a.m.; Joint Sessions all day with Systematic Section of Botanical Society of America and American Society of Plant Taxonomists; at New York Botanical Garden.

G3 *American Phytopathological Society*—9:00 a.m.; Business Meeting; Oak Room, Martinique. 10:30 a.m.; Business Meeting, Northeastern Division of Society; Oak Room, Martinique.

G4 *American Society of Plant Physiologists*—9:00 a.m.; Concurrent Session 1, joint session with Physiological Section of Botanical Society of America (Session 5); Winter Garden, McAlpin. 9:00 a.m.; Concurrent Session 2, joint session with Physiological Section of Botanical Society of America (Session 6); Ballroom, McAlpin.

G5 *American Society of Plant Taxonomists*—9:30 a.m.; Session, Business Meeting, Luncheon; Joint Meeting with Systematic Section of Botanical Society of America (Session 8); at New York Botanical Garden.

G6 *Botanical Society of America*—9:00 a.m.; Session 1, Business Meeting of Society; Colonial Room, McAlpin. 9:30 a.m.; Concurrent Session 2, General Session; Colonial Room, McAlpin. 9:30 a.m.; Concurrent Session 3, joint meeting of Microbiological Section with Mycological Society of America; Green Room, McAlpin. 9:00 a.m.; Concurrent Session 4, joint meeting of the Paleobotanical Section with the Society for the Study of Evolution; Symposium on the Role of the South Atlantic Basin in Biogeography and Evolution, Part I; main lecture room, Brander Matthews Hall, Columbia. 9:00 a.m.; Concurrent Session 5, joint meeting of Physiological Section and American Society of Plant Physiologists (Session 1); Winter Garden, McAlpin. 9:00 a.m.; Concurrent Session 6, joint meeting of Physiological Section and American Society of Plant Physiologists (Session 2); Ballroom, McAlpin. 9:30 a.m.; Concurrent Session 7, Botanical Teaching Section; Symposium on Basic Training for Specialization in Research; Blue Room, McAlpin. 9:30 a.m.; Concurrent Session 8; Business Meeting, Luncheon; Joint Meeting of Systematic Section, American Society of Plant Taxonomists, and

REGISTER NOW

for the New York Meeting of the AAAS

**AVOID CONGESTION AND DELAY
GET YOUR GENERAL PROGRAM
EARLY IN DECEMBER**

Registration in *advance* of arrival at the 116th Annual Meeting of the AAAS in the Pennsylvania Zone hotels of New York City, December 26-31, 1949, has so many advantages that we wonder why almost *everyone* doesn't take this simple step. For instance:

1. You avoid congestion and delay at the Registration Desks in the hotel foyers. All indications point to a record-breaking attendance since all of the Association's seventeen sections and subsections, and more than fifty societies, will have sessions; also this is the first meeting in New York City since 1928.
2. You receive the General Program early in December in ample time unhurriedly to decide among the events and the sessions of the societies that you wish to attend.
3. Your name and hotel address will be in the Visible Directory the first hour of the first day of the meeting, since it will be posted in Washington as soon as processed.
4. Advance Registrants will have the same privileges of receiving a map and directory of points of interest of New York City, literature, radio broadcast tickets, etc. At the convenience of Advance Registrants, these will be distributed from the Main Registration on the Penn Top of the Hotel Statler, the location of the Annual Science Exposition, the Visible Directory, and the Science Theatre. Admission to the excellent series of latest scientific films will be free to all Registrants.

This year, as a result of the vote of the biological societies, including the American Society of Naturalists, the sponsors, the Biologists' Smoker will be open only to regular registrants or those who pay a registration fee at the time.

— — — THIS IS YOUR ADVANCE REGISTRATION COUPON — — —

1. Registration Fee enclosed: (check one)
☐ \$2.00 A.A.A.S. Member
☐ \$2.00 Wife (or Husband) of Registrant
☐ \$2.00 College Student
☐ \$3.00 Non-member of A.A.A.S.
2. FULL NAME (Miss, Mrs., Dr., etc.) _____
(Please print or typewrite) (Last) (First) (Initial)
3. ACADEMIC, PROFESSIONAL OR BUSINESS CONNECTION _____
4. OFFICE OR HOME ADDRESS _____
(For receipt of Program and Badge)
5. YOUR FIELD OF INTEREST _____
6. CONVENTION ADDRESS _____
(If not known now may be added later)
7. DATE OF ARRIVAL _____ DATE OF DEPARTURE _____

Please mail this coupon and your check or money order for the fee, \$2.00 or \$3.00, to
THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
1515 Massachusetts Avenue, N.W., Washington 5, D. C.

HOTEL RESERVATIONS

116th AAAS MEETING

New York City, December 26-31, 1949

The list of hotels and the reservation coupon below are for your convenience in making your hotel room reservation in New York City. Please send your application, *not* to any hotel directly, but to the Housing Bureau of the New York Convention and Visitors Bureau to avoid delay and confusion. The experienced Housing Bureau will make assignments promptly and the hotel will send a confirmation directly to you in two weeks or less. Mail your application *now* to secure your first choice of desired accommodations

THIS IS YOUR HOTEL RESERVATION COUPON

Miss Sylvia T. Peltonen, Manager
Housing Bureau
New York Convention and Visitors Bureau
500 Park Avenue
New York 22, N. Y.

Date of application

Please reserve the following accommodations for the 116th Annual Meeting of the AAAS:

TYPE OF ACCOMMODATION DESIRED

Single Room	Rate	
Double Room	Rate	Number in Party
Other	Rate	Sharing this room will be:

persons
(Enumerate and attach list giving names and addresses of each person, including yourself)

CHOICE OF HOTEL

First choice Second choice Third choice

DATE OF ARRIVAL DEPARTURE DATE
(These must be indicated)

SIGNED

ADDRESS
(Street) (City and Zone) (State)

Mail this now to the Housing Bureau.

Rooms will be assigned and confirmed in order of receipt of reservation.

Hotel will confirm directly in two weeks or less.

HOTELS AND RATES* PER DAY

HOTEL**	WITHOUT BATH		WITH BATH		Twin Beds	3 Beds	4 Beds
	Single	Double	Single	Double			
STATLER			\$4.00 -\$7.50	\$6.50 -\$10.50	\$8.00 -\$14.00	\$11.00	\$13.00
NEW YORKER			\$4.50 -\$10.00	\$7.00 -\$13.50	\$8.00 -\$13.50	\$9.50 -\$10.50	\$12.00 -\$14.00
McALPIN	\$3.00 -\$3.50	\$5.00 -\$5.50	\$4.00 -\$7.00	\$6.50 -\$10.00	\$7.50 -\$11.00	\$9.50 -\$12.00	\$14.00 -\$17.50
GOVERNOR CLINTON			\$4.00 -\$6.00	\$6.50 -\$8.00	\$7.50 -\$9.50	\$10.50	\$12.00
MARTINIQUE	\$2.50 -\$3.00	\$5.75	\$3.75 -\$5.00	\$6.00 -\$8.00	\$6.00 -\$8.00	\$9.00	\$11.00

Suites range from \$10.00 to \$26.00; \$10.00 to \$18.00 at Martinique, \$12.00 to \$22.00 at New Yorker, \$12.50 to \$26.00 at Governor Clinton, \$13.00 to \$16.00 at McAlpin, and \$15.00 to \$17.00 at Statler.

The New Yorker charges \$2.50 for an additional person per room; the other hotels \$2.00.

* New York City Hotel-room Tax of 5% is not included in this schedule of rates.

** A list of the headquarters of each society appeared in THE SCIENTIFIC MONTHLY for August, pages iv and v, and in Association Affairs, SCIENCE, August 26, page 220.

American Bryological Society; at New York Botanical Garden.

G7 *Mycological Society of America*—9:30 a.m.; Session, joint meeting with Microbiological Section of Botanical Society of America (Session 3); Green Room, McAlpin.

G8 *Phycological Society of America*—9:00 a.m.; Symposium on the Culturing of Algae; Room F, McAlpin.

Psychology

I1 *Society for Research in Child Development*—9:30 a.m.; Symposium on Permissiveness versus Rigidity in Relation to Child Rearing, Personality, and Culture; North Ballroom, New Yorker.

Social and Economic Sciences

K and K1 *Section on Social and Economic Sciences; and Academy of World Economics*—10:00 a.m.; Joint Session; Chelsea Room, Governor Clinton.

K4 *American Sociological Society*—10:00 a.m.; Concurrent Session 1, Progress in Research in Racial and Cultural Relations; Gold Room, Manhattan Center. 10:00 a.m.; Concurrent Session 2, Industrial Sociology; Masonic Room, Manhattan Center. 10:00 a.m.; Concurrent Session 3, Frontiers of Demographic Research; Lounge, Manhattan Center.

K9 *Rural Sociological Society*—10:00 a.m.; Session, Rural Sociological Research in the Changing South; Parlors E-H, New Yorker.

Engineering

M and M2 *Section on Engineering; and New York Section of American Institute of Electrical Engineers*—9:00 a.m.; morning, afternoon, and evening; Visual Displays Illustrating the Principles of Television, joint exhibit; East Room, McAlpin.

Medical Sciences

N1 *Subsection on Medicine, N1m*—9:30 a.m.; Symposium on Adrenal Cortex, Part I; Keystone Room, Statler.

Education

Q1 *AAAS Cooperative Committee on Teaching of Science and Mathematics*—10:00 a.m.; General Session, joint meeting of all science teaching societies affiliated with the AAAS; Grand Ballroom, New Yorker.

Science in General

X6 *Sigma Delta Epsilon*—9:00 a.m.; National Council Meeting; Parlor C, Statler.

Wednesday Noon and Afternoon, December 28

AAAS as a Whole

AAAS George Westinghouse Science Awards, Luncheon—12:30 p.m.; Keystone Room, Statler.

British Association for the Advancement of Science—4:30 p.m.; Exchange Public Lecture on The Growing Importance of Infrared Studies in Physics, Chemistry and Biology, by a representative of the BAAS; Grand Ballroom, Statler.

Mathematics

A1 *American Mathematical Society*—2:00 p.m.; Gen-

eral Session; Room 301, Pupin Laboratories. 3:15 p.m.; Concurrent Session 1; Room 301, Pupin Laboratories. 3:15 p.m.; Concurrent Session 2; Room 329, Pupin Laboratories. 4:30 p.m.; Josiah Willard Gibbs Lecture, McMillan Theatre, Columbia.

Astronomy

D *Section on Astronomy*—1:30 p.m.; Session, Ballroom, McAlpin.

Zoological Sciences

F *Section on Zoological Sciences*—12:00 noon; Annual Business Meeting of Section; Grand Ballroom, Statler.

F1 *American Society of Parasitologists*—1:30 p.m.; Annual Luncheon and Business Meeting; Grand Ballroom, Statler. 2:30 p.m. until 5:00 p.m.; Demonstration Session; Room 903, Schermerhorn Hall, Columbia.

F3 *American Society of Zoologists*—12:00 noon; Annual Business Meeting of the Society (immediately following Business Meeting of Section F); Grand Ballroom, Statler. 2:00 p.m.; Concurrent Session 1, General Physiology; Parlor 1, Statler. 2:00 p.m.; Concurrent Session 2, Embryology; Parlor 2, Statler. 2:00 p.m.; Concurrent Session 3, Cytology; Parlor A, Statler. 2:00 p.m.; Concurrent Session 4, Protozoology and Parasitology; Parlor B, Statler.

Zoological and Botanical Sciences

FG2 *American Society of Human Genetics*—2:00 p.m.; Session; Gramercy Room, Governor Clinton. 4:30 p.m.; Annual Business Meeting; Chelsea Room, Governor Clinton.

FG3 *American Society of Limnology and Oceanography*—2:00 p.m.; Joint Session with the Ecological Society of America; Room 411, Kent Hall, Columbia.

FG6 and FG7 *Biometric Society (Eastern North American Region); and Biometric Section, American Statistical Association*—4:00 p.m.; Symposium on The Use of Rationally Developed Equations in Biology; Joint session; Hotel Biltmore.

FG8 *Ecological Society of America*—2:00 p.m.; Concurrent Session 1, General Ecology; Room 502, Kent Hall, Columbia. 2:00 p.m.; Concurrent Session 2, Plant Ecology and Plant Geography; Room 515, Kent Hall. 2:00 p.m.; Concurrent Session 3, Limnology and Oceanography; Joint Session with American Society of Limnology and Oceanography; Room 411, Kent Hall.

FG9 *Genetics Society of America*—2:00 p.m.; Concurrent Session 1; Governor Room, Governor Clinton. 2:00 p.m.; Concurrent Session 2; Florentine Room, Governor Clinton.

FG10 *National Association of Biology Teachers*—2:00 p.m.; Teaching Aids from Outside the Classroom and Laboratory; Parlors F-G, New Yorker.

FG11 *Society for the Study of Evolution*—2:00 p.m.; Symposium on the Role of the South Atlantic Basin in Biogeography and Evolution, Part II; Main lecture room, Brander Matthews Hall, Columbia.

Botanical Sciences

G1 *American Bryological Society*—Joint Sessions, all day, with Systematic Section of Botanical Society of

America and American Society of Plant Taxonomists; at New York Botanical Garden.

G3 *American Phytopathological Society*—1:30 p.m.; Concurrent Session 1, Stone Fruit and Citrus Virus Diseases; Oak Room, Martinique. 3:00 p.m.; Session 2, Stone Fruit Versus Disease Conference; Oak Room, Martinique. 1:30 p.m.; Concurrent Session 3, Vegetable and Small Fruit Crop Diseases; Gold Room, Martinique. 1:30 p.m.; Concurrent Session 4, Conference of Extension Plant Pathologists; El Patio, McAlpin.

G4 *American Society of Plant Physiologists*—1:30 p.m.; Symposium on Some Growth Phenomena Clarified by Tissue and Organ Culture, joint session with Physiological Section of Botanical Society of America (Session 3); Winter Garden, McAlpin. 4:00 p.m.; Business Meeting; Winter Garden, McAlpin.

G5 *American Society of Plant Taxonomists*—2:00 p.m.; Film; Inspection of Herbarium and Library; Joint Session with Systematic Section, Botanical Society of America (Session 5); at New York Botanical Garden.

G6 *Botanical Society of America*—2:00 p.m.; Concurrent Session 1, General Section; Colonial Room, McAlpin. 2:00 p.m.; Concurrent Session 2, Symposium on Mechanism of Cellulose Degradation by Chemical and Biological Agents; Joint Meeting of Microbiological and Paleobotanical Sections; Crystal Room, McAlpin. 1:30 p.m.; Concurrent Session 3, Symposium on Some Growth Phenomena Clarified by Tissue and Organ Culture; Joint Meeting of Physiological Section and American Society of Plant Physiologists; Winter Garden, McAlpin. 2:00 p.m.; Concurrent Session 4, Botanical Teaching Section; Symposium on Botany as a Recreational Subject; Blue Room, McAlpin. 2:00 p.m.; Concurrent Session 5, Film; Inspection of Herbarium and Library; Joint Meeting of the Systematic Section and the American Society of Plant Taxonomists; at New York Botanical Garden.

G7 *Mycological Society of America*—2:00 p.m.; Session; Green Room; McAlpin.

G8 *Phycological Society of America*—2:00 p.m.; Business Meeting; Room F, McAlpin.

Psychology

I1 *Society for Research in Child Development*—2:30 p.m.; Symposium on the Concept of Maturity from the Anatomical, Physiological, and Psychological Points of View; North Ballroom, New Yorker.

Social and Economic Sciences

K4 *American Sociological Society*—1:15 p.m.; Concurrent Session 1, The American Soldier; Gold Room, Manhattan Center. 1:15 p.m.; Concurrent Session 2, Recent Contributions to Family Theory in Different Fields; Masonic Room, Manhattan Center. 1:15 p.m.; Concurrent Session 3, Current Research; Lounge, Manhattan Center. 3:30 p.m.; Concurrent Session 4, Significant Fields of Rural Research; Gold Room, Manhattan Center. 3:30 p.m.; Concurrent Session 5, Mobility in the American Stratification System; Masonic Room, Manhattan Center. 3:30 p.m.; Concurrent Session 6, Social Research in the Federal Government; Lounge, Manhattan Center.

K8 *Pi Gamma Mu*—12:00 noon; Luncheon for invited guests; Greeley Room, Governor Clinton.

K9 *Rural Sociological Society*—12:00 noon; Rural Sociological Research in the Corn and Wheat Belts; Parlors E-H, New Yorker.

Education

Q2 *National Science Teachers Association*—2:00 p.m.; Third National Conference of Industry-Science Teaching Relations; Grand Ballroom, New Yorker.

Science in General

X1 *American Nature Study Society*—2:30 p.m.; Session, Nature Photography; Panel Room, New Yorker.

X3 *Phi Kappa Phi*—1:30 p.m.; Business Meeting; Chelsea Room, Governor Clinton.

X6 *Sigma Delta Epsilon*—12:30 p.m.; Luncheon, Address, Announcement of Award; Georgian Room, Statler.

Wednesday Evening, December 28

AAAS as a Whole

AAAS Presidential Address—8:00 p.m.; Ten Million Scientists; Grand Ballroom, Statler.

AAAS Reception—9:30 p.m.; Grand Ballroom and adjacent rooms, Statler. (Reception open only to registrants.)

AAAS Section M; New York Section of American Institute of Electrical Engineers—8:00 p.m.; Round Table Discussion on Technology of Television; Crystal Room, McAlpin.

Mathematics

A1 *American Mathematical Society*—6:30 p.m.; Meeting of Council of Society; Room 4, John Jay Hall, Columbia.

Zoological Sciences

F3 *American Society of Zoologists*—6:00 p.m.; Zoologists' Dinner; Gold and Oak Rooms, Martinique.

Zoological and Botanical Sciences

FG12 *American Institute of Biological Sciences*—9:30 p.m.; Conference of Secretaries of Biological Societies; Room F, McAlpin.

Botanical Sciences

G3 *American Phytopathological Society*—8:00 p.m.; Concurrent Session 1, The Teaching of Plant Pathology; Winter Garden, McAlpin. 8:00 p.m.; Concurrent Session 2, Fungicide Colloquium; Ballroom, McAlpin. 8:00 p.m.; Concurrent Session 3, Plant Disease Forecasting; East Room, Martinique.

Social and Economic Sciences

K4 *American Sociological Society*—7:00 p.m.; Joint Dinner with the Conference on Family Welfare; Grand Ballroom, New Yorker.

K9 and K3 *Rural Sociological Society; and American Farm Economic Association*—8:00 p.m.; Joint Session, The Future of Rural Life in the United States; North Ballroom, New Yorker.

Engineering

M and M2 *Section on Engineering; New York Sec*

ion of American Institute of Electrical Engineers—
8:00 p.m.; Joint Program, Round Table Discussion on
Technology of Television; Crystal Room, McAlpin.

Science in General

X4 National Association of Science Writers—7:30
p.m.; Business Meeting; Parlor A, Statler.

Thursday Morning, December 29

AAAS as a Whole

AAAS Section Secretaries' Conference—11:30 a.m.;
Conference and Lunch for all section secretaries; Parlor
2, Statler.

AAAS Cooperative Committee—8:00 a.m.; Meeting
of the officers of all science teaching organizations affili-
ated with the AAAS to plan the 1950 Coordinated Pro-
gram; Parlor A, New Yorker. 10:00 a.m.; General Ses-
sion, meeting with all science teaching organizations;
Grand Ballroom, New Yorker.

Forum on Research and National Security, Detlev
Bronk, Chairman—10:00 a.m.; Grand Ballroom, Statler.

AAAS Subsection Nm—9:30 a.m.; Symposium on
Adrenal Cortex, Part II; Keystone Room, Statler.

Mathematics

A1 American Mathematical Society—10:00 a.m.; Gen-
eral Session, Annual Business Meeting; Cole Prize Ad-
dress; Room 301, Pupin Laboratories.

A4 National Council of Teachers of Mathematics—
10:15 a.m.; Concurrent Session 1; Room 211, Teachers
College, Columbia. 10:15 a.m.; Concurrent Session 2,
Room 200, Teachers College. 10:15 a.m.; Concurrent
Session 3; Room 300, Teachers College.

Astronomy

D Section on Astronomy—9:30 a.m.; Contributed
Papers; Greeley Room, Governor Clinton.

Geology and Geography

E and E3 Section on Geology and Geography;
Geological Society of America—9:00 a.m.; Joint Pro-
gram; North Ballroom, New Yorker.

Zoological Sciences

F1 American Society of Parasitologists—9:00 a.m.;
Session; Room 501, Schermerhorn Hall, Columbia.

F3 American Society of Zoologists—9:00 a.m.; Con-
current Session 1, Animal Behavior and Sociobiology;
Joint Meeting with Ecological Society of America;
Georgian Room, Statler. 9:00 a.m.; Concurrent Session
2, General Physiology; Parlor 1, Statler. 9:00 a.m.;
Concurrent Session 3, Endocrinology; Parlor A, Statler.
9:00 a.m.; Concurrent Session 4, Cell Physiology; Parlor
B, Statler.

F4 Society of Systematic Zoology—9:00 a.m.; An-
nual Breakfast and Business Meeting; Parlor 2, Statler.

Zoological and Botanical Sciences

FG2 American Society of Human Genetics—Demon-
strations, all day; Parlors F and J, Governor Clinton.

**FG3 American Society of Limnology and Oceanog-
raphy**—9:30 a.m.; Session; Florentine Room, Governor
Clinton.

FG8 Ecological Society of America—9:00 a.m.; Ses-
sion, Animal Behavior and Sociobiology; Joint Meeting
with American Society of Zoologists; Georgian Room,
Statler.

FG9 Genetics Society of America—9:00 a.m.; Invi-
tation Program; 309 Havemeyer Hall, Columbia.

FG10 National Association of Biology Teachers—
8:00 a.m.; Committee Meeting of the officers of all AAAS-
affiliated science teaching organizations, to plan the Co-
ordinated Program for 1950; Parlor A, New Yorker.

FG11 Society for the Study of Evolution—9:00 a.m.;
Session; Room 902, Schermerhorn Hall, Columbia.

Botanical Sciences

G3 American Phytopathological Society—9:00 a.m.;
Concurrent Session 1, Tobacco and Potato Diseases; Oak
Room, Martinique. 9:00 a.m.; Concurrent Session 2,
Wheat, Oat, and Corn Diseases; Gold Room, Martinique.
9:00 a.m.; Concurrent Session 3, Symposium on Per-
formance of New Fungicidal Sprays and Dusts in 1949;
El Patio, McAlpin. 9:00 a.m.; Concurrent Session 4,
Council Meeting; West Room, Martinique. 10:30 a.m.;
Session 5; West Room, Martinique.

G4 American Society of Plant Physiologists—9:00
a.m.; Concurrent Session 1, joint session with Physiologi-
cal Section of Botanical Society of America (Session 5);
Winter Garden, McAlpin. 9:00 a.m.; Concurrent Ses-
sion 2, joint session with Physiological Section of Bo-
tanical Society (Session 6); Ballroom, McAlpin.

G5 American Society of Plant Taxonomists—9:30
a.m.; Session, joint meeting with Systematic Section of
Botanical Society of America (Session 7); Crystal Room,
McAlpin.

G6 Botanical Society of America—9:00 a.m.; Con-
current Session 1, Business Meeting of Society; Colonial
Room, McAlpin. 9:30 a.m.; Concurrent Session 2, Gen-
eral Section; Colonial Room, McAlpin. 9:30 a.m.; Con-
current Session 3, joint meeting of Microbiological Sec-
tion with Mycological Society of America; Green Room,
McAlpin. 9:30 a.m.; Concurrent Session 4, Paleobo-
tanical Section; Blue Room, McAlpin. 9:00 a.m.; Con-
current Session 5, joint meeting of Physiological Section
and American Society of Plant Physiologists (Session
1); Winter Garden, McAlpin. 9:00 a.m.; Concurrent
Session 6, joint meeting of Physiological Section and
American Society of Plant Physiologists (Session 2);
Ballroom, McAlpin. 9:30 a.m.; Concurrent Session 7,
joint meeting of Systematic Section with American So-
ciety of Plant Taxonomists; Crystal Room, McAlpin.

G7 Mycological Society of America—9:30 a.m.; Ses-
sion, joint meeting with Microbiological Section of Bo-
tanical Society (Session 3); Green Room, McAlpin.

Psychology

I1 Society for Research in Child Development—9:30
a.m.; Presidential Address and Business Meeting; Panel
Room, New Yorker.

Social and Economic Sciences

K2 Alpha Kappa Delta—8:00 a.m.; Annual Meeting
and Breakfast; Parlors E-H, New Yorker.

K4 American Sociological Society—9:00 a.m.; Concurrent Session 1, Japan's Population Prospects; Gold Room, Manhattan Center. 9:00 a.m.; Concurrent Session 2, Industrial Sociology; Masonic Room, Manhattan Center. 9:00 a.m.; Concurrent Session 3, Family Statistics in the United States; Lounge, Manhattan Center.

K9 Rural Sociological Society—8:00 a.m.; Session, Rural Sociological Research on Cultural Changes in the Appalachian Ozark Region; East Room, New Yorker. 10:00 a.m.; Session, Rural Sociological Research in the Urbanized Northeast; Parlors F-G, New Yorker.

K10 Society for the Psychological Study of Social Issues—10:00 a.m.; Symposium on Racial and Religious Prejudice; East Room, Martinique.

Engineering

M and M2 Section on Engineering; New York Section of American Institute of Electrical Engineers—9:00 a.m.; Morning, afternoon, and evening; Visual Displays Illustrating the Principles of Television, joint exhibit; East Room, McAlpin.

Medical Sciences

N Subsection on Medicine Nm—9:30 a.m.; Symposium on Adrenal Cortex, Part II; Keystone Room, Statler.

Education

Q1 and Q2 AAAS Cooperative Committee on the Teaching of Science and Mathematics; and National Science Teachers Association—8:00 a.m.; Committee Meeting of the officers of all science teaching organizations affiliated with the AAAS, to plan the Coordinated Program for 1950; Parlor A, New Yorker. 10:00 a.m.; General Session; Grand Ballroom, New Yorker.

Q3 The Federation of Science Teachers Associations of New York City—10:00 a.m.; Fourth Annual Junior Scientists Assembly; Grand Ballroom, New Yorker.

Science in General

X1 American Nature Study Society—8:00 a.m.; Committee Meeting of the officers of all science teaching organizations affiliated with the AAAS, to plan the Coordinated Program for 1950; Parlor A, New Yorker.

X3 Phi Kappa Phi—8:00 a.m.; Breakfast and Business Meeting; Chelsea Room, Governor Clinton.

X6 Sigma Delta Epsilon—7:30 a.m.; Convention Breakfast; Parlors F-G, New Yorker.

Thursday Noon and Afternoon, December 29

AAAS as a Whole

AAAS Council Meeting—4:30 p.m.; Parlor 2, Statler.

AAAS Cooperative Committee on the Teaching of Science and Mathematics—1:30 p.m.; Symposium on Science in General Education; Grand Ballroom, Statler. 3:30 p.m.; Panel Discussion on Improvement of Science Instruction on the College Level; Grand Ballroom, Statler.

AAAS Section B—2:00 p.m.; Symposium on Present State of Physics, Part I—Elementary Particles; Georgian Room, Statler.

AAAS Section G—2:00 p.m.; Panel Discussion on Botany in the Service of Man; Winter Garden, McAlpin.

AAAS Subsection Nm—2:00 p.m.; Symposium on Adrenal Cortex, Part III; Keystone Room, Statler.

Mathematics

A1 American Mathematical Society—2:00 p.m.; Concurrent Session I; Room 301, Pupin Laboratories. 2:00 p.m.; Concurrent Session 2; Room 329, Pupin Laboratories.

A2 Institute of Mathematical Statistics—2:00 p.m.; Session I-13, joint session with American Statistical Association; Green Room, McAlpin. 4:00 p.m.; Session I-12, Review of Stochastic Processes; Joint session with American Statistical Association; Green Room, McAlpin.

A4 National Council of Teachers of Mathematics—12:30 p.m.; Luncheon; John Jay Dining Hall, Columbia. 2:30 p.m.; Concurrent Session 1; Room 211, Teachers College, Columbia. 2:30 p.m.; Concurrent Session 2; Room 200, Teachers College. 2:30 p.m.; Concurrent Session 3; Room 300, Teachers College. 4:30 p.m.; Reception; Men's Faculty Club, Columbia.

Physics

B Section on Physics—2:00 p.m.; Symposium on Present State of Physics, Part I—Elementary Particles; Georgian Room, Statler.

Astronomy

D Section on Astronomy—2:00 p.m.; Session; Chelsea Room, Governor Clinton.

Geology and Geography

E and E3 Section on Geology and Geography; Geological Society of America—2:00 p.m.; Joint Program; North Ballroom, New Yorker.

Zoological Sciences

F1 American Society of Parasitologists—2:00 p.m.; Session; Room 501, Schermerhorn Hall, Columbia.

F3 American Society of Zoologists—12:30 p.m.; Luncheon and Business Meeting, Committee for the Study of Animal Societies Under Natural Conditions; Dining room, Statler. 3:30 p.m.; Open House and Tea; Department of Animal Behavior, American Museum of Natural History. 4:30 p.m.; Informal Symposium; Department of Animal Behavior, American Museum of Natural History. 2:00 p.m.; Concurrent Session 1, General Morphology, Ecology, Evolution, and Genetics; Room 902, Schermerhorn Hall, Columbia. 2:00 p.m.; Concurrent Session 2, *Demonstrations*; Rooms 652 and 654, Schermerhorn Hall. 2:00 p.m.; Concurrent Session 3, *Demonstrations by Motion Picture Films*; Room 201, Fayerweather Hall, Columbia.

Zoological and Botanical Sciences

FG3 American Society of Limnology and Oceanography—2:00 p.m.; Session; Florentine Room, Governor Clinton.

FG6 and FG7 Biometric Society; and Biometric Section, American Statistical Association—2:00 p.m.; Session, Long-time Follow-up in Morbidity Studies; Hotel Biltmore.

FG9 Genetics Society of America—2:00 p.m.; Concurrent Session 1, *Demonstration Papers*; Room 903-913, Schermerhorn Hall, Columbia. 2:00 p.m.; Concurrent Session 2; Room 309, Havemeyer Hall, Columbia.

FG13 Proposed Society of Industrial Microbiologists
—4:00 p.m.; Organization Meeting; Ballroom, McAlpin.

Botanical Sciences

G Section on Botanical Sciences—2:00 p.m.; Panel Discussion on Botany in the Service of Man; Joint Session of societies of Sections G and FG; Winter Garden, McAlpin.

G3 American Phytopathological Society—1:30 p.m.; Concurrent Session 1, Fruit Crop Diseases; Oak Room, Martinique. 1:30 p.m.; Concurrent Session 2, Forage and Miscellaneous Field Crop Diseases; Gold Room, Martinique. 1:30 p.m.; Concurrent Session 3, Diseases of Ornamentals; El Patio, McAlpin. 1:30 p.m.; Concurrent Session 4, Demonstration of Foreign Plant Quarantine Inspection Methods; West Room, Martinique. 2:30 p.m.; Session 5, Council Meeting; West Room, Martinique.

G9 Torrey Botanical Club—12:30 p.m.; Luncheon and Address; Colonial Room, McAlpin.

Social and Economic Sciences

K and K4 Section on Social and Economic Sciences; and American Sociological Society—2:00 p.m.; Panel Discussion on The Status and Prospects of the Social Sciences, joint session; Gold Room, Manhattan Center.

K4 American Sociological Society—2:00 p.m.; Session 1, see preceding joint session with Section K; Gold Room, Manhattan Center. 1:15 p.m.; Concurrent Session 2, Sociological Theory; Masonic Room, Manhattan Center. 1:15 p.m.; Concurrent Session 3, The Understanding of a Foreign Culture, joint session with the American Political Science Association; Lounge, Manhattan Center. 3:30 p.m.; Concurrent Session 4, Sociology and Psychiatry; Masonic Room, Manhattan Center. 3:30 p.m.; Concurrent Session 5, Current Research; Lounge, Manhattan Center.

K5 American Statistical Association—4:00 p.m.; Review of Stochastic Processes, joint session with Institute of Mathematical Statistics; Green Room, McAlpin.

K9 Rural Sociological Society—1:00 p.m.; Session, A Critique of Basic Research; Parlors F-G, New Yorker. 3:00 p.m.; Session, Rural Sociological Research in the Pacific Coast States; Parlors F-G, New Yorker.

Medical Sciences

N1 Subsection on Medicine, Nm—2:00 p.m.; Symposium on Adrenal Cortex, Part III; Keystone Room, Statler.

Education

Q1 AAAS Cooperative Committee on the Teaching of Science and Mathematics—1:30 p.m.; Symposium on Science in General Education; Grand Ballroom, Statler. 3:30 p.m.; Panel Discussion on Improvement of Science Instruction on the College Level; Grand Ballroom, Statler.

Thursday Evening, December 29

AAAS as a Whole

Biologists' Smoker, sponsored by American Society of Naturalists—9:00 p.m. until 12:00 midnight; Roosevelt

Hall, American Museum of Natural History. (All welcome, but open only to registrants, or those who pay a registration fee upon arrival.)

AAAS Section M; New York Section of American Institute of Electrical Engineers—8:00 p.m.; Joint Program, Round Table Discussion on the Impact of Television on Society and Future Developments; Crystal Room, McAlpin.

AAAS Subsection Nm—7:30 p.m.; Symposium on Adrenal Cortex, Part IV; Keystone Room, Statler.

AAAS Cooperative Committee on Teaching of Science and Mathematics—6:30 p.m.; Joint Banquet of all science teaching societies affiliated with AAAS; Grand Ballroom, New Yorker.

Mathematics

A1 and A3 American Mathematical Society; and Mathematical Association of America—6:30 p.m.; Dinner for the mathematical organizations; John Jay Hall Dining Room, Columbia.

A4 National Council of Teachers of Mathematics—6:30 p.m.; Dinner; Men's Faculty Club, Columbia.

Zoological and Botanical Sciences

FG2 American Society of Human Genetics—8:00 p.m.; Address of the Retiring President of Society; Governor Room, Governor Clinton.

FG4 American Society of Naturalists—9:00 p.m. till 12:00 midnight; Biologists' Smoker; Roosevelt Hall, American Museum of Natural History. All biologists welcome, but open only to registrants or those who pay a registration fee upon arrival.

Botanical Sciences

G3 American Phytopathological Society—6:30 p.m.; Annual Dinner of Society; Ballroom, McAlpin.

G6 Botanical Society of America—6:30 p.m.; Dinner for all botanists, Cranbrook Award, Presidential Address; Winter Garden, McAlpin.

Social and Economic Sciences

K4 American Sociological Society—8:00 p.m.; General Session of the Society; Grand Ballroom, Statler.

History and Philosophy of Science

L, L1, and L2 Section on History and Philosophy of Science; American Philosophical Association; Philosophy of Science Association—8:00 p.m.; Joint Session; Panel Room, New Yorker.

Engineering

M and M2 Section on Engineering; New York Section of American Institute of Electrical Engineers—8:00 p.m.; Joint Program, Round Table Discussion on the Impact of Television on Society and Future Developments; Crystal Room, McAlpin.

Medical Sciences

N1 Subsection on Medicine—7:30 p.m.; Symposium on Adrenal Cortex, Part IV; Keystone Room, Statler.

Education

Q1 AAAS Cooperative Committee on Teaching of

Science and Mathematics—6:30 p.m.; Joint Banquet of all science teaching societies affiliated with AAAS; Grand Ballroom, New Yorker.

Science in General

X2 *Federation of American Scientists*—8:00 p.m.; General Meeting; Georgian Room, Statler.

Friday Morning, December 30

AAAS as a Whole

Academy Conference—10:00 a.m.; Session; Parlor A, New Yorker.

AAAS Section B—9:30 a.m.; Symposium on the Present State of Physics, Part II—Physics of the Solid State; Georgian Room, Statler.

Mathematics

A2 *Institute of Mathematical Statistics*—9:00 a.m.; Session I-15, Symposium on Statistical Methods in Astronomy; Joint Program with American Statistical Association and AAAS Section D; Governor Room, Governor Clinton.

A3 *Mathematical Association of America*—9:30 a.m.; Session and Business Meeting; Room 301, Pupin Laboratories, Columbia.

Physics

B *Section on Physics*—9:30 a.m.; Symposium on the Present State of Physics, Part II—Physics of the Solid State; Georgian Room, Statler.

Chemistry

C *Section on Chemistry*—8:45 a.m.; Session; Key-stone Room, Statler.

Astronomy

D *Section on Astronomy*—9:00 a.m.; Symposium on Statistical Methods in Astronomy, joint session with Institute of Mathematical Statistics and American Statistical Association; Governor Room, Governor Clinton.

Geology and Geography

E and E3 *Section on Geology and Geography; Geological Society of America*—9:00 a.m.; Joint program; North Ballroom, New Yorker.

Zoological Sciences

F3 *American Society of Zoologists*—9:00 a.m.; Concurrent Session 1, General Physiology; Parlor 1, Statler. 9:00 a.m.; Concurrent Session 2, Endocrinology; Parlor 2, Statler. 9:00 a.m.; Concurrent Session 3, Embryology; Parlor A, Statler. 9:00 a.m.; Concurrent Session 4, Cellular and General Physiology; Parlor B, Statler.

Zoological and Botanical Sciences

FG3 *American Society of Limnology and Oceanography*—9:30 a.m.; Session; Florentine Room, Governor Clinton.

FG4, FG8, FG9, F3, G4, and G6 *American Society of Naturalists; Ecological Society of America; Genetics Society of America; American Society of Zoologists; American Society of Plant Physiologists; and Botanical*

Society of America—9:00 a.m.; Symposium on Reproduction in Plants; Joint Meeting; Grand Ballroom, Statler.

FG6 and FG7 *Biometric Society; Biometric Section, American Statistical Association*—10:00 a.m.; Session, joint meeting; Hotel Biltmore.

Botanical Sciences

G3 *American Phytopathological Society*—9:00 a.m.; Business Meeting; Oak Room, Martinique. 10:30 a.m.; Concurrent Session 2, Diseases of Forest and Shade Trees; Oak Room, Martinique. 11:00 a.m.; Concurrent Session 3, Flax, Safflower, Rice, and Sugar Cane Diseases; Gold Room, Martinique.

G6 *Botanical Society of America*—9:30 a.m.; Concurrent Session 1, General Section; Colonial Room, McAlpin. 9:30 a.m.; Concurrent Session 2, joint meeting of Microbiological Section with Mycological Society of America; Green Room, McAlpin. 9:30 a.m.; Concurrent Session 3, Botanical Teaching Section; Blue Room, McAlpin.

G7 *Mycological Society of America*—9:30 a.m.; Session, joint meeting with Microbiological Section of Botanical Society of America (Session 2); Green Room, McAlpin.

Social and Economic Sciences

K4 *American Sociological Society*—9:00 a.m.; Concurrent Session 1, Methods of Empirical Research in Sociology; Gold Room, Manhattan Center. 9:00 a.m.; Concurrent Session 2, Social Mobility and Social Stratification in European Societies; Masonic Room, Manhattan Center. 9:00 a.m.; Concurrent Session 3, Social Structure of the Public Schools; Joint Meeting with American Political Science Association; Lounge, Manhattan Center.

K5 *American Statistical Association*—9:00 a.m.; Symposium on Statistical Methods in Astronomy; Joint Program with Institute of Mathematical Statistics and AAAS Section D; Governor Room, Governor Clinton.

K9 *Rural Sociological Society*—8:00 a.m.; Session, Rural Sociological Research in the Semi-Arid West; Parlors F and G, New Yorker.

History and Philosophy of Science

L, L1, and L2 *Section on History and Philosophy of Science; American Philosophical Association; and Philosophy of Science Association*—9:30 a.m.; Joint Session; Panel Room, New Yorker.

Engineering

M and M2 *Section on Engineering; New York Section of American Institute of Electrical Engineers*—9:00 a.m.; morning, afternoon, and evening; Visual Displays Illustrating the Principles of Television, joint exhibit; East Room, McAlpin.

Medical Sciences

N2 *Subsection on Dentistry*—9:30 a.m.; Session; El Patio, McAlpin.

Education

Q3 *The Federation of Science Teachers Associations of New York City*—Field Trips (arranged in advance).

Science in General

X1 *American Nature Study Society*—8:30 a.m.; All Day Field Trip; Starting from Parlor B, New Yorker.

X8 *The Academy Conference*—10:00 a.m.; Session; Parlor A, New Yorker.

Friday Noon and Afternoon, December 30**AAAS as a Whole**

Academy Conference—2:30 p.m.; Session; Parlor A, New Yorker.

AAAS Section B—1:30 p.m.; Symposium on the Present State of Physics, Part III—Chemical Physics; Georgian Room, Statler. 3:30 p.m.; Symposium on the Present State of Physics, Part IV—Biophysics; Georgian Room, Statler.

AAAS Section F—2:00 p.m.; Symposium on Steroid Hormones and Sex Differentiation in Vertebrates; Grand Ballroom, Statler.

Mathematics

A3 *Mathematical Association of America*—2:30 p.m.; Session; Room 301, Pupin Laboratories, Columbia.

Physics

B *Section on Physics*—1:30 p.m.; Symposium on the Present State of Physics, Part III—Chemical Physics; Georgian Room, Statler. 3:30 p.m.; Symposium on the Present State of Physics, Part IV—Biophysics; Georgian Room, Statler.

Chemistry

C *Section on Chemistry*—2:00 p.m.; Session; Key-stone Room, Statler.

Geology and Geography

E, E1, and E2 *Section on Geology and Geography; American Geographical Society of New York; and Association of American Geographers*—2:00 p.m.; Joint session; North Ballroom, New Yorker.

Zoological Sciences

F *Section on Zoological Sciences*—2:00 p.m.; Symposium on Steroid Hormones and Sex Differentiation in Vertebrates; Grand Ballroom, Statler.

Zoological and Botanical Sciences

FG1 *American Microscopical Society*—4:00 p.m.; Annual Business Meeting; Parlor 2, Statler.

FG11 *Society for the Study of Evolution*—1:00 p.m.; Business Meeting of Society; Room 902, Schermerhorn Hall, Columbia. 2:00 p.m.; Session; Room 902, Schermerhorn Hall.

Botanical Sciences

Trip to Boyce Thompson Institute for Plant Research—1:30 p.m.; Buses leave Hotel McAlpin; return 5:30 p.m.

G2 *American Fern Society*—2:00 p.m.; Session; Blue Room, McAlpin.

G3 *American Phytopathological Society*—1:30 p.m.; Concurrent Session 1, joint meeting with Mycological Society of America; Crystal Room, McAlpin. 1:30 p.m.;

Concurrent Session 2, Fungicides and Methods of Application; Oak Room, Martinique. 1:30 p.m.; Concurrent Session 3, Virology; Gold Room, Martinique. 1:30 p.m.; Session 4, Council Meeting; West Room, Martinique.

G6 *Botanical Society of America*—2:00 p.m.; Concurrent Session 1, General Section; Colonial Room, McAlpin. 2:00 p.m.; Concurrent Session 2, joint meeting of Microbiological Section with Mycological Society of America; Green Room, McAlpin.

G7 *Mycological Society of America*—1:30 p.m.; Concurrent Session 1, joint meeting with the American Phytopathological Society; Crystal Room, McAlpin. 2:00 p.m.; Concurrent Session 2, joint meeting with Microbiological Section of Botanical Society of America (Session 2); Green Room, McAlpin.

Social and Economic Sciences

K *Section on Social and Economic Sciences*—2:30 p.m.; Joint Session with Econometric Society; Topic: Economics and Technology; Production Functions; Governor Room, Governor Clinton.

K4 *American Sociological Society*—1:15 p.m.; Concurrent Session 1, Opportunities for Social Research in the 1950 Censuses; Gold Room, Manhattan Center. 1:15 p.m.; Concurrent Session 2, Experimental Study of Small Groups; Masonic Room, Manhattan Center. 1:15 p.m.; Concurrent Session 3, Human Ecology; Lounge, Manhattan Center.

K6 *Econometric Society*—2:30 p.m.; Joint Session with Section K; Topic: Economics and Technology: Production Functions; Governor Room, Governor Clinton.

K7 *Metric Association*—2:30 p.m.; Annual Meeting; Society's Suite, Governor Clinton.

History and Philosophy of Science

L, L1, and L2 *Section on History and Philosophy of Science; American Philosophical Association; and Philosophy of Science Association*—2:00 p.m.; Joint Program; Panel Room, New Yorker.

Medical Sciences

N2 *Subsection on Dentistry*—2:00 p.m.; Session; El Patio, McAlpin.

Agriculture

O *Section on Agriculture*—2:00 p.m.; Symposium on Whither Soil Conservation?; Ballroom, McAlpin.

Education

Q3 *The Federation of Science Teachers Associations of New York City*—Series of Field Trips; for details, see Booth of Federation, New Yorker.

Science in General

X8 *The Academy Conference*—2:30 p.m.; Session; Parlor A, New Yorker.

Friday Evening, December 30**AAAS as a Whole**

Academy Conference—6:00 p.m.; Academy Conference Dinner; Place to be announced.

AAAS Section F—8:00 p.m.; Symposium on The

Kinsey Report and Its Contributions to Related Fields; Grand Ballroom, Statler.

Chemistry

C *Section on Chemistry*—7:15 p.m.; Session; Keystone Room, Statler.

Zoological Sciences

F *Section on Zoology*—8:00 p.m.; Symposium on The Kinsey Report and Its Contributions to Related Fields; Grand Ballroom, Statler.

Zoological and Botanical Sciences

FG4 *American Society of Naturalists*—8:00 p.m.; Annual Meeting, Presidential Address; Parlor 1, Statler.

Social and Economic Sciences

K7 *Metric Association*—6:30 p.m.; Board Meeting and Dinner; Society's Suite, Governor Clinton.

History and Philosophy of Science

L, L1, and L2 *Section on History and Philosophy of*

Science; American Philosophical Association; and Philosophy of Science Association—8:00 p.m.; Joint Program; Panel Room, New Yorker.

Medical Sciences

N2 *Subsection on Dentistry*—7:30 p.m.; Dinner and Informal Round Table Discussion; Blue Room, McAlpin.

Science in General

X8 *The Academy Conference*—6:00 p.m.; Academy Conference Dinner; Place to be announced.

Saturday Morning, December 31

Chemistry

C *Section on Chemistry*—8:30 a.m.; Session; Keystone Room, Statler.

Saturday Noon and Afternoon, December 31

Chemistry

C *Section on Chemistry*—1:30 p.m.; Session; Keystone Room, Statler.

Annual Science Exposition

The AAAS Annual Science Exposition is located in the Penn Top and adjacent Salle Moderne, large rooms on the 18th floor of the Hotel Statler. From the hotel lobby, the Exposition is readily reached by express elevators which are marked 10-18.

Admission to the Annual Science Exposition is open to all adults attending the Meeting. During periods of congestion, if necessary, admission will be restricted to registrants and invited guests with admission coupons. Limitations of space make impossible the admission of children. The evening of Wednesday, December 28, has been set aside, primarily, for New York high school seniors who are serious science majors and have tickets.

Hours of the Annual Science Exposition

Monday, December 26	2: 00 p.m. to 6: 00 p.m.
Tuesday, December 27	9: 00 a.m. to 9: 00 p.m.
Wednesday, December 28	9: 00 a.m. to 9: 00 p.m.
Thursday, December 29	9: 00 a.m. to 6: 00 p.m.
Friday, December 30	9: 00 a.m. to 6: 00 p.m.
Saturday, December 31	9: 00 a.m. to 12 noon

Special Exhibits

Technically not a part of the Annual Science Exposition, but associated with it, are:

1. THE ANNUAL INTERNATIONAL PHOTOGRAPHY-IN-SCIENCE SALON, sponsored by *The Scientific Monthly* and the Smithsonian Institution. This is located on the walls of the part of the Salle Moderne that houses the Visible Directory of Registrants. This outstanding exhibition of 175 color and black-and-white prints is described under AAAS Prize Awards.

2. THE FIFTH OPEN EXHIBIT OF TECHNICAL PHOTOGRAPHY, sponsored by the Photographic Society of America. This is located on one wall of the short corridor connecting the Penn Top and the Salle Moderne. Some 25 accepted prints, which represent only the Technical Division of this large 1949 P.S.A. Exhibition of Photography, are on display. Previously, these were shown at the City Art Museum, St. Louis, October 17-November 1.

3. THE EXHIBIT OF THE U. S. NATIONAL BUREAU OF STANDARDS. This occupies the other wall of the corridor connecting the Penn Top and the Salle Moderne, and consists of three parts, entitled:

Unification of Screw Threads—An accord was reached between the United States, Great Britain, and Canada to promote commerce between these nations by the standardization of threaded parts for greater interchangeability of products; *Electron-Optical Shadow Method*—A technique developed at the N.B.S. provides a valuable new tool for the quantitative study of electrostatic and magnetic fields of extremely small dimensions; *An Atomic Standard of Frequency and Time*—A new, primary standard of frequency and time developed at the National Bureau of Standards is based on the constant natural frequency associated with the vibration of the atoms in the ammonia molecule.

Exhibits in the Annual Science Exposition

An exhibition of the latest and best in scientific books, instruments, and materials, by firms that produce or distribute such essential aids to science, has been a feature of the meetings of the Association for many years. Perhaps the first organized exhibition of the AAAS should be established as the one held in conjunction with the 79th

Meeting in Washington, D. C., 1924. There were, however, exhibits in preceding years. Represented were such pioneers as the American Optical Company, Bausch and Lomb Optical Company, Central Scientific Company, Eastman Kodak Company, General Biological Supply House, Inc., E. Leitz, Inc., and Ward's Natural Science Establishment, Inc.—all of whom, incidentally, are in the 1949 Annual Science Exposition. The continued participation of these concerns, and of many others who have come to exhibit regularly, clearly indicates that the Exposition is of mutual advantage to the scientists in attendance and to the exhibitors.

This year some 70 exhibitors, including a gratifying number of companies new to this Exposition, are occupants of the 86 booths. They fill all the available space (there were late-comers that, unfortunately, could not be accommodated). All exhibitors have invested funds, time, and effort to set up their exhibits and to man their booths during the convention week. They are glad to have an exceptional opportunity to meet customers in person, to benefit from the experience of those who consume their products, and to learn of new needs which they may be able to fill. Those who provide the tools of science also advance science. As crowded as the week is, nearly everyone will find time to see the Annual Science Exposition of 1949.

This year the Exposition is unusually compact and convenient—but, necessarily, the aisles are narrower than ideal. For this reason, all are asked to *enter the Penn Top*—which has two long aisles, thus four rows of booths—and to *leave through the Salle Moderne*, which houses 19 booths, the Visible Directory, and the Photography-in-Science Salon.

The exhibitors and short descriptions of their exhibits follow in alphabetical order:

AAAS. New Member Service—Science—The Scientific Monthly. (Booth located in main corridor, across from main Registration.) There are personal advantages in joining the Association. Every person in attendance at the 116th Meeting who is not a member of the AAAS is cordially invited to visit the New Member Service for information concerning the Association. Since its founding, in 1848, the Association has admitted to membership not only professional scientists but also other men and women who have a general interest in science, who wish to keep informed of the progress of science, and who would like to support the high purposes of the one organization that represents all science.

Included in the annual dues of \$6.50 (for 1950), each member has a choice of a year of *Science*, the professional scientist's newsweekly, or *The Scientific Monthly* (or both, for an additional \$3.50). Free sample copies of these two publications will be distributed. Members of the AAAS are requested to nominate fellow scientists for membership, and all not familiar with both magazines are invited to visit this booth. *Prospective advertisers* may obtain sample copies of the magazines and rate cards.

Academic Press, Inc. (Booth 1A). It is the aim of Academic Press to aid research workers in the various

fields of science in keeping abreast of all recent developments. Visitors stopping at the Academic Press display will find an array of books intended to fulfill this purpose. They will note the "Advances" series which have become well established and are published yearly. Chemists, biochemists, and biologists alike will be able to peruse reviews in their special spheres of interest, while physicists and mathematicians may browse through publications of such Nobel Prize winners as Sommerfeld and von Laue. Those active in industry and the teaching profession alike will not want to miss Feigl's new book, *Chemistry of specific, selective and sensitive reactions*, or Foster's *Chemical activities of fungi*, and a great many others. A stop at the Academic Press exhibit will also acquaint members and friends of the AAAS with future publications scheduled for the coming year.

Aero Service Corporation (Booth 76). Relief maps—formed in lightweight, durable plastic—are the new teaching aids exhibited by Aero Service Corporation. A portfolio of 12 U. S. Geological Survey quadrangles, representing typical physiography in the United States, will be shown. Selected by leading educators, these quadrangle portfolios are now in use in nearly 300 college geology and geography classes. Each quad, 17 by 22 inches in size, weighs only 4 ounces. Additionally, a handsome 9-color relief map of Venezuela will be exhibited. Its scale is 1:1,250,000; its size, 45 by 56 inches; its weight, only 2 pounds. These maps have been distributed to many Venezuelan schools and government agencies by Creole Petroleum Corporation. In production is a new plastic relief map of the United States in 11 colors. Its size will be 64 by 40 inches; its weight, less than three pounds. It will give the American student of any age a vivid, accurate understanding of his country's physiography.

Albino Farms (Booth 19). The Albino Farms, P. O. Box 331, Red Bank, New Jersey, will exhibit their laboratory animals which are bred on their farms. The animals will consist of Swiss White Mice, White Rats, C 57 Mice and Hamsters. Cages will be used to house the animals and are expected to be placed in a position so that the convenience of the members will be assured. A representative will be on hand at all times to answer inquiries relative to the animals being displayed. Those members wishing to discuss the problems pertaining to the animals may ask to see Mr. M. L. Wachtel, who is qualified in this regard. All members are invited to visit our exhibit, and it is the desire of the Albino Farms to see to it that you become acquainted with us and our purpose to serve science in all its relationships with our animals for comparable and exact results by meeting exact specifications desired by the scientific fields.

American Book Company (Booth 14). American Book Company, publishers of school and college textbooks, has on display a representative selection of its newer and active publications in the field of science. Featured at the exhibit is advance proof of the eighth edition of Gray's *Manual of botany* which has been in preparation for over 20 years and the publication of which is eagerly

awaited by the profession. Included in the exhibit is a copy of the first edition—a rare collector's item—as well as copies of the succeeding editions published over the interval of a hundred years. Containing some 1,600 pages with over 1,800 illustrations, almost wholly rewritten, chiefly by Professor Merritt Lyndon Fernald, with three genera revised by their greatest living masters, the book contains about 8,000 species and varieties. The publication of this book is an event of major importance in the history of education and in educational publishing.

American Cancer Society, Inc. (Booths 59 and 60).

American Cancer Society—Organization and Program: Under a diagram showing the organization of the American Cancer Society, the various aspects of its program, including education, service, research, and Field Army activities are portrayed by means of three-dimensional figures and illuminated drawings. Side panels show cancer centers by state in relation to population and the distribution of funds. Charles S. Cameron, M.D., Medical and Scientific Director.

American Instrument Company, Inc. (Booth 81).

The American Instrument Company will exhibit: *Electrophoresis Apparatus*. . . . The most advanced and complete electrophoresis laboratory housed in a compact and portable unit for research and routine work; *Rotary Warburg Apparatus*. . . . New and improved design for microrespiration studies; *Coleman Spectrophotometer*. . . . Truly universal, 5 instruments in one—spectrophotometer, photofluorometer, nephelometer, titrator, and sensitive galvanometer; *MacBeth pH Meter*. . . . A new dual titration meter and pH meter of utmost sensitivity and flexibility; *Automatic Pipetting Machine*. . . . For delivering accurately measured quantities of liquids (0.05 to 60-ml volumes) into ampoules, vials, etc.; *Constant Temperature Bath*. . . . For close, dependable temperature control; *Waring Blendor*. . . . The speediest and most efficient device for the preparation of extractions, suspensions, and emulsions; *Micro Kjeldahl Apparatus*. . . . Electrically heated, for micro and semimicro digestions and Soxhlet extractions.

American Optical Company (Booths 53 and 54).

The Instrument Division of the American Optical Company will display several new instruments. The new laboratory microscopes, either with or without attached substage illuminators, are more rigid and one-third lighter than previous models, and much improved in design. The MC Delineascope is a three-purpose projector for 2 in. × 2 in. slides and single or double frame slidefilm. The Scholar's Microscope, with a built-in light source, is smaller and more convenient than most school models, and is practically foolproof, even for the beginning microscopist. A simplified stereoscopic microscope with a double nosepiece and platen stage is less expensive but of the same optical quality as other Spencer microscopes. The electronic drive Microfilm Reader enlarges 16-mm microfilm conveniently. The Phase Microscope, the 735 Microscope Lamp, the Hb-Meter, polarizing and metallurgical microscopes, microtomes, colorimeter, refractometer, and the GK Auditorium Delineascope also will be

shown. Representatives W. F. Butler, W. E. Folland, G. W. Frid, and O. E. Schaefer will be in attendance to discuss any optical questions presented.

American Tobacco Company, Inc. (Booths 31 and 32). The exhibit of the American Tobacco Company's Research Laboratory, Richmond, Virginia, will stress the role of technology in the selection and processing of tobacco, as well as the manufacture of tobacco products. Samples of the more important tobacco types and a variety of compounds which have been identified in tobacco will be displayed. Each sample will be suitably labeled and described. In addition, a short sound movie will cover some of the activities within the laboratory and will include references to the progress of research in the tobacco industry. Mr. O. L. Hillsman and Mr. J. M. Moseley will be in attendance.

Appleton-Century-Crofts, Inc. (Booth 50). Appleton-Century-Crofts, Inc., enters, in 1950, its 125th year of book publishing. The present firm was established in 1948 as the result of the merger of D. Appleton-Century Company, Inc., established in 1933, and F. S. Crofts & Co., founded in 1924. D. Appleton-Century Company, Inc., was itself the result of the merger of The Century Co., founded in 1870, and D. Appleton and Company, founded in 1825. These famous publishing houses have been distinguished for their contributions to education, particularly in the areas of the sciences. Among the books exhibited at the Appleton-Century-Crofts booth in the Annual Science Exposition are outstanding college textbooks, by noted authorities, in the fields of anthropology, astronomy, biology, botany, chemistry, education, general science, geology, mathematics, medicine, and psychology. Many of these books have become standard texts in their fields. All of them are in use in universities and colleges throughout the country.

Bausch and Lomb Optical Company (Booths 47, 48, and 49). At the Bausch and Lomb booths, visitors will have an opportunity to examine and use many of the latest B & L developments in the scientific instrument line. These instruments will include the new Research Microscope, Model E, with low position, fine adjustment, and latest developments in Phase Contrast Microscope Accessories and Microscope Illuminators. The recently introduced Student Microscope, Wide Field Stereoscopic and Polarizing Microscopes with five-axis Universal stage will be shown. Visitors who bring their own microscope slides will have an opportunity of examining them with these new instruments. Photomicrographers will be able to see and operate the new photomicrographic equipment, Model L, which is adaptable over a wide range of magnification and specimen selections. The new "Abbe-56" Refractometer will be a featured instrument in the display of refractometers and spectroscopes which are useful teaching aids in physics and chemistry, as well as for research and laboratory work.

Biological Abstracts (Booth 78). A cooperative, non-profit journal published by biologists for biologists, *Biological Abstracts* is the only abstracting and indexing

service in the world that affords an adequate coverage of the literature in all fields of biology. Currently abstracting upward of 3,000 journals, the coverage is being expanded as rapidly as possible to include many more European, Scandinavian, and Asiatic journals that are not available to the scientists of this country.

As well as the complete edition, *Biological Abstracts* also is published in nine low-priced sectional editions that were specially designed for individual biologists who are interested only in one or more closely related fields. These sectional editions, and the complete edition, will be on display—and the Editor-in-Chief and Business Manager will be in attendance to welcome visitors and furnish information. Stop in at Booth No. 78 and see how one scientific journal has solved the high cost of printing.

Bioscope Manufacturing Company (Booth 34). The Bioscope is an instrument designed primarily for classroom projection of microscopic material. It may either take the place of microscopes or simplify and speed up the use of microscopes. This instrument projects microscopic material downward on a table or on a wall screen where a large group may study the subject and have particular parts actually pointed out to them. Many teachers say the Bioscope, which costs less than one microscope, has the teaching value of a dozen microscopes. Standard equipment includes one 16× projection lens, one 8× wide field projection lens, lifetime transformer and polarizing attachment. Height 24 inches, weight 12 pounds.

Blakiston Company (Booth 4). Come by the Blakiston Company's booth to see Schmalhausen's *Factors of evolution* and Gates's *Pedigrees of Negro families*, both new contributions to their fields; Lee's *Vade Mecum*, internationally known as the outstanding work on histologic technique; Suckling's *Examination of water supplies*; Newton's *Recent advances in physiology*; Emerson and Shields' *Laboratory and field exercises in botany*, which can be used with any standard text, but which with Emerson's *Basic botany* gives a unique coverage of the field for freshman students; and don't miss seeing Blakiston's *New Gould medical dictionary*—the first completely new unabridged medical dictionary in 38 years—contains hundreds of new words, including terms used in biology, botany, pharmacy, medical physics, and chemistry. An anatomical atlas with 252 illustrations, 129 in color, makes this the most complete, most useful research tool available.

Bussey Products Company (Booth 21). Bussey Products Company presents its complete line of laboratory cages for small animals as well as feeding and watering devices. Sample cages for mice, rats, hamsters, guinea pigs, rabbits, and monkeys are displayed. Bussey's popular "Permaweld" process is featured in these cages. All laboratory equipment shown is available for immediate shipment.

Cambridge Instrument Company, Inc. (Booth 58). Of interest to scientists in many fields, important developments in Cambridge instruments are presented. For use

in measuring radioactive emission, Cambridge shows its Precision Ionization Meter (Failla Design), "Chang & Eng" Fast Neutron Detector, Lindemann-Ryerson Electrometer which incorporates improvements developed by the Ryerson Laboratory during the recent war, and the Cambridge Pocket Gamma-Ray Dosimeter with Charging Unit. For use in medicine, Cambridge exhibits two portable Electrocardiographs, its "Simpli-Trol" model Standard String Galvanometer instrument and its "Simpli-Scribe" Direct Writer. The Cambridge exhibit also includes: the multipurpose combination model Cambridge Surface Pyrometer with three interchangeable thermocouples. Cambridge Research pH Meter which uses an electron-ray null-point indicator in making precision determinations; sensitivity .005 pH, reproducibility .01 pH. The sturdy and inexpensive Cambridge Pot Galvanometer, a combined pointer and reflecting galvanometer for general and student use.

Canadian Radium and Uranium Corporation (Booth 75). The Seederer-Kohlbusch Microbalance is being exhibited. Resembling the conventional analytical balance in appearance, the instrument contains a small radioactive source, mounted upon the beam. Any movement of this latter registers as an unbalance in the two halves of a split ionization chamber, connected in opposition. The final significant figures are read directly upon the output meter of a vacuum tube electrometer. A sensitivity of 10^{-8} gm is attained, with a reproducibility on the order of one microgram.

Another new development to be demonstrated is the "Télicon"; an instrument by means of which radiation fields may be viewed in relation to their sources and other nearby objects. Phenomena such as the rarefaction and compression zones of sound waves, and the scatter and absorption of radium gamma radiation are clearly visible. The exhibit includes a number of photographs of various radiation field phenomena, photographed by means of this instrument.

Carolina Biological Supply Company (Booth 33). The Carolina Biological Supply Company of Elon College, North Carolina, and Waubun Laboratories of Schriever, Louisiana, will be represented at the Annual Science Exposition by an attractive and interesting exhibit. The exhibit will include biological materials from the culture, slide, preserved materials, and other departments, to illustrate the most up-to-date methods of cultivation of microorganisms, the preparation of microscope slides, and the preservation and injection of macroscopic specimens. Several processes will be completely demonstrated, thus serving to illustrate routine practices in our laboratories. A staff of professional biologists will be in charge of the exhibit and will offer a complete biological materials information service. Literature, including teaching aids, will be available free of charge to those viewing the exhibit. We extend a cordial invitation to you to visit with us in our booth.

Fred S. Carver Inc. (Booth 27). We will exhibit the new model of our standard ten-ton Carver Laboratory Press. The new model incorporates certain refinements,

modifications and changes, but is basically the same standard equipment which has been accepted as standard laboratory apparatus by government laboratories, colleges, universities, and research institutions all over the world. The press will be shown with its standard accessories for numerous pressing tests in the biological, chemical, physical, and mechanical fields. One of the unique features of this equipment is the Carver standard accessories available for optional use. These provide means for handling numerous materials for some 60 general applications of small-scale pressing tests. We will also have on display a museum collection showing samples of work done by users with the Carver Laboratory Press. Samples will include plastic molded items; laminations; pressed oils and liquids; extracts; briquetted items, metallographic mountings; crushing, breaking, and shear test specimens; etc.

Central Scientific Company (Booths 28 and 29). The Central Scientific Company exhibit will feature a new line of Cenco D.C. measuring instruments including Wheatstone Bridges, Potentiometers, Volt Boxes and Resistance Boxes; a new Pressovac Pump for vacuum only, guaranteed to produce 25 microns; the new Cenco Titration-pH Stand and Apparatus; the Cenco Electronic Electrometer; new All-Metal Slide Rule; the Cenco Anthropometer; a new laboratory model Radiation Meter; Synchronous Motor Drive Laboratory Timer; new Adjustable Laboratory Tripod; Fluorescent Mineral Kit with Ultraviolet Lamp and many other new instruments of interest to scientists.

Cinchona Products Institute, Inc. (Booth 7). A display showing colored illustrations of malaria plasmodia, pictures of the cinchona plantations in Java, the major research projects carried on in universities and medical schools here and in Holland. Literature on the use of cinchona alkaloids as well as the book *Cinchona in Java* will be available for free distribution.

Coreco Research Corporation (Booth 5). Featured will be the Coreco Automatic Color Camera, Model #300. The "Coreco" Camera is designed to photograph all surface areas of the body—from 1-to-1 close-up pictures to half-body size—and all cavities of the human body, such as mouth, throat, ear, nose, vagina, and rectum. The camera carries its own specially developed, fully color-corrected bulb and a mechanism for complete control of its color, temperature, and exposure within the camera itself. There is an automatic view finder synchronized with the automatic camera mechanism to permit viewing until a fraction of a second before exposure. The camera provides for automatic focusing. An x-ray film applicator is included, making it possible to record all sizes and densities of x-ray film on Kodachrome transparencies.

Thomas Y. Crowell Company (Booth 16). The Thomas Y. Crowell Company, publishers of books, will present a display of its college texts and reference books at the Annual Science Exposition, December 26-31, New York City. These are largely in the fields of chemistry, geography, anthropology, biology, and the social sciences.

Featured in the Crowell Booth will be a new introductory biology text by William Etkin, the newly revised *Introductory college chemistry* (2d edition) by Joseph A. Babor and Alexander Lehrman—both books scheduled for publication early in 1950—and the recently revised *Experimental general chemistry* (2d edition) by J. W. Neckers, T. W. Abbott, and K. A. Van Lente. Copies of these new books will be available for inspection. Over thirty other books will be on display. Among them will be such recently published texts as *World political geography* by G. Etzel Pearey, Russell H. Fifield and Associates, *Man in environment: An introduction to sociology* by Paul H. Landis, and *General anthropology* by Harry Holbert Turney-High. The list will include, as well, Spanish translations of several Crowell texts in the science field.

Denoyer-Geppert Company (Booth 24). Denoyer-Geppert Company will have on display eight of the new Kampmeier Anatomy Charts, a rather wide selection of models for anatomy and biology, some demonstration and museum preparations, and a selection of imported wall charts for zoology and comparative anatomy. We wish to call special attention to the Kampmeier Anatomy Charts, which include systems heretofore not presented in large size chart form such as the lymphatic system, urogenital system, and the topography of organs in male and female. A portion of our exhibit will be devoted to the display of Kodachrome slides covering many fields of the biological sciences. We shall be pleased to have the opportunity of consulting with you in the selection of sustained-use visual teaching aids best suited to your particular requirements and look forward to your visit to our exhibit.

Eastman Kodak Company (Booths 17 and 18). On exhibit by the Eastman Kodak Company are photomicrographs illustrating the use of photography in autoradiography, nuclear physics, and other fields of science. Projection apparatus is available for examining autoradiographs and nuclear events in photographic plates.

Encyclopaedia Britannica (Booth 71). On display will be the latest printing of the oldest, most honored, and most widely read encyclopaedia in the English language. *Encyclopaedia Britannica* is the product of more than 4,000 eminent contributors representing the world's great authorities in every field of knowledge from sixty-two different countries. Exhibitors will explain *Encyclopaedia Britannica's* continuous revision policy, and how the Britannica owner of today is kept up to date with the *Britannica book of the year*, a one-volume, annual encyclopaedia of approximately a million words and written by many of the same, world-famous contributors. This basic reference work of technical and professional men and women for more than 180 years is now indexed with half a million references and cross references, and is a part of Britannica's Ten-Year Program, which includes research services and other features of inestimable value. Be sure to visit this interesting Britannica exhibit, where you may inspect the latest, 1949 copyright. You will receive a colorful booklet which tells you more about *Encyclopaedia Britannica*.

Gamma Scientific Company (Booth 44). The Gamma Exhibit will feature a variety of scientific instruments and laboratory apparatus such as Micro Balance, Rapid Industrial Balance, Chemical Micro Manipulator, Photomicrographic Camera, Metallographic Microscope, Polarimeter, Refractometer, etc. We call your special attention to the Oertling Micro Balance made in England and recently introduced in this country. This balance actually permits reproducible readings to .001 mg. All models shown are either being exhibited for the first time or represent design improvements introduced within the last year.

General Biological Supply House, Inc. (Booths 63 and 64). The exhibit of General Biological Supply House, Inc. will include a wide range of teaching materials for the biological sciences. Living forms, such as Volvox, Pandorina and other flagellates, will be shown through microprojection. New unbreakable rubber anatomical models will be displayed, as will be many new biological charts. Microscope slides and Kodachrome lantern slides will be available for examination and for projection. The exhibit will also include many living and preserved plant and animal specimens, and the latest developments in field collecting equipment.

Grune and Stratton, Inc. (Booth 80). Among the many books in the scientific and medical fields published by Grune & Stratton, the following recent publications will be of particular interest to those attending the convention: Linksz, *Physiology of the eye*, Volume I: *Optics*, which will be followed shortly by two more volumes dealing with physiology of vision and biochemistry of the eye; Penrose, *Biology of mental defect*; Vannotti and Delachaux, *Iron metabolism and its clinical significance*; Rappaport, *Rapid microchemical methods for blood and cerebrospinal fluid examinations*; Ponder, *Hemolysis and related phenomena*; Davis, *Shock and allied forms of failure of the circulation*. Advance material on a new periodical, *Circulation*, the journal of the American Heart Association, will be available as well as recent issues of *Blood*, the journal of hematology, and the several important special issues of *Blood*.

Harper & Brothers, Publishers (Booth 46). On display will be the new and standard publications of Harper & Brothers and their medical department, Paul B. Hoeber, Inc. The majority of the titles featured in the exhibit are selected texts and reference books from the fields of botany, zoology, medicine, geology, mathematics, engineering, chemistry, psychology, sociology, and education. Also available for examination are recent popular books of special interest to the scientist and to the educated layman. Representing the company at the booth will be Kenneth B. Demaree, Robert G. Hawley, Paul B. Hoeber, Jr., and Edward W. Nichols.

International Business Machines Corporation (Booths 11, 12, and 13). International Business Machines will display its new electronic Card-Programmed Calculator, which is its latest commercially produced equipment for the solution of problems involving se-

quence calculations in the fields of engineering, applied and theoretical science, as well as business and industry. This equipment makes possible the economical solution at high speeds of extensive problems which have hitherto been impractical for many scientists or organizations. The IBM exhibit will be manned by personnel who can discuss the application of this and other IBM calculating equipment to problems in many fields faced by scientists attending the convention and exposition. Also of interest will be the recently announced Electronic Statistical Machine, which is noteworthy because, simultaneously, it sorts, counts, accumulates, balances, edits, and prints statistical information. Built with small or large capacities, the IBM Statistical Machine provides a means of obtaining many types of comprehensive statistical analyses in minimum time. Representatives will also be on hand to discuss the entire line of IBM Electric Punched Card Accounting Equipment as applied to various fields of science and industry. Also displayed will be the IBM Electric Typewriter and IBM Electronic Self-regulated, Time Indicating, Recording and Signaling Systems.

Jarrell-Ash Company-National Spectrographic Laboratories, Inc. (Booth 38). The optical laboratory instruments which Jarrell-Ash Company are exhibiting will feature equipment manufactured by Hilger & Watts, Ltd., London, England, and will include a complete outfit for emission spectrochemical analysis, ultraviolet and infrared monochromators and probably ultraviolet and infrared spectrophotometers and a Raman spectrograph with source unit. A new polarimeter reading to .001° and a refractometer reading to .00001, both with glass scales, will be displayed. Jarrell-Ash will demonstrate a new Baker phase contrast microscope in which the condenser diaphragm stop remains the same for all objectives. There will also be the new Cooke Universal microscope, A. O. polarizing microscope and photomicrographic equipment. An Oertling balance with projected scale, reading from .1 mgm. to 1 gram without opening the case will be shown. There will be an assortment of x-ray cameras. Technical personnel will be on hand to demonstrate the equipment. In attendance will be: Richard E. Ashley, Richard F. Jarrell, Howard A. Morrison, Jr., and J. Albert Rudden.

Kahl Scientific Instrument Corporation (Booth 8). The Kahl Scientific Instrument Corporation Exhibit will include: 1—Instruments for marine research such as bottom grabs, underwater current meters to indicate both velocity and direction, plankton nets, and other apparatus used for limnological studies. 2—Meteorological instruments, primarily several new types of electric psychrometers, and mercury-amalgam thermometers ranging down to minus 75° F. 3—Precision Thermometers of the highest quality and accuracy, such as Beckmann Thermometers, Calorimetric Thermometers, Fractional Degree Thermometers. 4—High vacuum apparatus, including a new type mercury diffusion high vacuum pump, 3-stage style, with freeze-out trap. 5—A new type of gas-flow control apparatus, nonmechanical, which can be adjusted to limit the flow of gases to an infinitesimal quantity.

This instrument is provided with a manometer to indicate varying gas pressures in the system.

E. Leitz, Inc. (Booth 52). Leitz will show its new Monocular and Binocular Medical Microscopes and will also show the well-known Research Microscope ORTHO-LUX, with built-in illumination, the Universal Microscope and Photomicrographic Apparatus PANPHOT, and the Stereo-Binocular Microscopes after Greenough. Also exhibited will be the Low and High Power Binocular Magnifiers, the Ultropak Illuminator for observation in reflected light, and the Micro-Projector with synchronous objective-condenser changer Model XI-c. Various photomicrographic cameras will also be shown.

Linguaphone Institute (Booth 22). Because international communication on a level of clear understanding is of the greatest importance to scientists, The Linguaphone Institute of New York, publishers of home-study conversational language courses in 29 of the world's most important languages, is proud to exhibit at the AAAS meeting. At its booth, visitors can enjoy a free trial lesson in any language from Afrikaans to Swedish.

J. B. Lippincott Company (Booth 51). Look to J. B. Lippincott Company, Philadelphia, Pennsylvania, for timely, practical and authoritative information—for selected professional books in all fields of medicine and allied sciences, and in education. Here is a continual indication of current trends and needs which serves as the basis for new and revised clinical volumes and textbooks. Here are reports of the outstanding and significant work being done by those making very real contributions to scientific progress.

The Macmillan Company (Booths 65 and 66). The book exhibit sponsored by The Macmillan Company at the December 1949 meeting consists of approximately 800 titles. In addition to undergraduate and graduate textbooks and reference works, there will be a large number of technical and scientific books of interest to the general reader. Books in the fields of various hobbies and avocations—photography, gardening, radio, outdoor life, and others—are represented, as are books of special interest to young readers. The major classifications are agriculture, the biological sciences, chemistry, engineering, history and philosophy of science, home economics, mathematics, medical science, and physics. Mr. Boyd T. Harris, Science Editor, together with other members of the College Department, will represent The Macmillan Company at this exhibit.

McGraw-Hill Book Company, Inc. (Booths 35 and 36). The McGraw-Hill Book Company's exhibit will be comprised of more than 300 volumes, covering every field of modern science. In addition to standard texts and reference work in all fields of natural, physical, and social science, there will be numerous new and revised work of great importance. Specially featured will be ten or more volumes of the National Nuclear Energy Series, sponsored by the Atomic Energy Commission, ranging in subject matter from pharmacology of uranium com-

pounds to electronic techniques in nuclear research, contributed and edited by the scientists who are carrying on the vital developments in our national and university laboratories. Many new texts and reference books in advanced physics, zoology, chemistry, and natural history will also be featured.

McGregor and Werner, Inc. (Booth 79). McGregor & Werner, Inc., 1640 Connecticut Avenue, N.W., Washington, D. C., is a service organization working with and for scientific and technical societies and publishers. The entire staff of trained technicians and salesmen of the Corporation are cleared to handle classified material. The functions the organization offers to the scientific and technical fields are briefly listed below. *Translations:* All Western European languages, Russian and most of the Oriental and some African languages. *Technical Writing:* Instruction, operating, maintenance, and engineers manuals. *Editing:* Editing for content, style, and for press. *Cataloging:* Complete cataloging services from the warehouse bin to the printed catalog. *Indexing and Abstracting:* Indexing for books, catalogs, and abstracting. *Art Work:* Illustration, drafting, and design in any medium. *Copy Preparation for Offset Printing:* Vari-Typer and Proportional Spacing Machine composition for rapid and economical large scale production. *Printing:* Letterpress and offset book printing, reprinting, binding, warehousing, and distribution. Come and see us at Booth Number 79. We may be able to help you solve your publication problems.

G. & C. Merriam Company (Booth 39). The G. & C. Merriam Company exhibit will consist of a sample display of the various publications of the company which we list herewith: *Webster's new international dictionary*, 2d edition, *Webster's new collegiate dictionary*, *Webster's dictionary of synonyms*, *Webster's biographical dictionary*, *Webster's geographical dictionary* (To be published Nov. 14, 1949), *A pronouncing dictionary of American English picturesque word origins*. In addition there will be displayed for distribution copies of various pamphlet material dealing with instruction in and the use of the various books mentioned above. Souvenirs will be provided.

Philip Morris and Company, Ltd., Inc. (Booth 67). Philip Morris and Company will demonstrate the method by which it was found that Philip Morris Cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes. Their representative will be happy to discuss researches on this subject, and problems on the physiological effects of smoking.

The C. V. Mosby Company (Booth 42). The C. V. Mosby Company of St. Louis will display its varied line of scientific publications. Among the recent reference and text releases will be the following: *Anderson Pathology*, *Ackerman-Regaton Cancer*, *Kleiner Human biochemistry*, *Davison Handbook of materia medica, toxicology and pharmacology*, *Kantor Handbook of digestive diseases*, *Campbell Operative Orthopedics*, *Slocum Atlas of amputations*, *Lee Official preparations of pharmacy*, *Regan*

The doctor and patient and the law, Francis *Introduction to human anatomy*, Zoethout *Introduction to human physiology*, Zoethout-Tuttle *Textbook of physiology*, Arnow-Reitz *Introduction to organic and biological chemistry*, Whiteford-Coffin *Essentials of college chemistry*, Anthony *Anatomy and physiology laboratory manual*, Vogel *Anatomy and physiology laboratory manual*, and Flitter *Introduction to applied physics*. Visitors attending the AAAS meeting are cordially invited to look over these and other scientific publications on display.

National Geographic Society (Booth 23). The exhibit of the National Geographic Society will feature the display of a selection of natural color slides by automatic projector. The slides cover National Geographic expeditions and were selected from illustrations by staff photographers of the *National Geographic*.

National Spectrographic Laboratories, Inc. (Booth 70). The National Spectrographic Laboratories' representatives will be prepared to discuss the analysis of agricultural materials such as plant tissues and soils and biological samples for their metallic element contents. Charts for the correlation of nutrient balance in plants for ten elements will be shown. Arrangements may be made with the National Spectrographic Laboratory representative for the analysis of your materials in their laboratory. Spectrographic equipment will be shown jointly with the Jarrell-Ash Company in Booth No. 38.

New York Scientific Supply Company, Inc. (Booth 45). The exhibit of the New York Scientific Supply Company, New York, New York, will feature its first showing of Nysseo-Glo Everlasting Biological Models made of rubber composition, as well as Nysseo-Glo Muscular Skeletons. Details of preparations, colored with specially developed luminescent paints, are amazingly clear when exposed to near-violet light (black light), glowing vividly and brilliantly, and becoming visible in all parts of the room, even in diffused light. The exhibit will also include Nysseo Biological Charts, Transpar Plastic Insect Mounts, museum preparations, Economy Tube Life-Histories in solid media, and many other visual aids of interest to the natural scientist. Convention visitors are cordially invited to visit our building at 28 West 30 Street, which is within short walking distance of the exhibit hall.

Nuclear Instrument and Chemical Corporation (Booth 69). The Nuclear booth will display a complete line of instruments for radioactivity measurement and research. The display includes instruments for classroom teaching purposes as well as those for specialized research laboratories. Operating demonstrations of both types of instruments will be shown, as well as pocket size and portable dosimeters and radioactivity monitors. Competent engineers will be available to suggest answers to instrumentation problems or teaching methods.

The Nucleonic Corporation of America (Booth 55). The exhibit of The Nucleonic Corporation of America will include Model RC-1: A compact, light weight instrument, combining count rate meter and binary scale of 64 with

panel mounted register; Model RC2T: A compact, light weight instrument combining decade scale of 100, preset and elapsed timer; Model RC1E; Count Rate Meter: A compact, light weight instrument, with 3 ranges; 500, 5,000, 50,000 counts per minute; *Note:* All of the foregoing instruments contain a high voltage supply. Other features on the scaling unit are: scale selection, and preset count, as well as provision for external pre-amplification. Also included are Model RM1: Portable battery operated, very light weight survey meter, containing variable high voltage supply used in surveying for alpha, beta, and gamma radiation; Model GM1W: Geiger Tubes—series of mica end window tubes ranging in thickness from 0.7 mg. per square cm. and up, window diameter $1\frac{1}{8}$ "; Model GM1N: Similar to GM1W, except for smaller window area— $10/16$ ", used with portable lead shield for directional detection; and Accessories: Lead shields, sample holders, probes, etc.

Pfaltz & Bauer, Inc. (Booth 56). Pfaltz & Bauer, Inc., Empire State Building, New York, New York, were established in 1900 and since have been an important supplier of scientific instruments and chemicals to laboratories in the educational and industrial field. This firm has been a distributor of Beckman Instruments since 1936—carrying a complete stock of control instruments produced by the National Technical Laboratories, maintaining a well-equipped service department for the scientists' immediate needs. They are sole agents for an important manufacturer of Projection Reading Balances of the Macro and Micro Types as well as Polarimeters, Phase-Contrast Microscopes, Microtomes, etc. Pfaltz & Bauer are also manufacturers of Photo-Electric Instruments—the first to develop the Fluorophotometer for vitamin assays which today is being used by every important laboratory doing this type of work throughout the world. All of these and other instruments will be on display. Their shops are well equipped for development work and they respectfully solicit your valued inquiries.

Philosophical Library (Booth 57). The Philosophical Library exhibit will consist of a series of their publications (books).

Prentice-Hall, Inc. (Booth 15). Visitors to the Annual Science Exposition are invited to examine the books on display at the Prentice-Hall booth. Some of the books on display will be the following new titles and revisions: *Organic chemistry: Brief course* by Ray Q. Brewster; *Life science*, 4th edition by Max W. de Laubenfels; *Introduction to psychopathology* by Lawrence O'Kelly; *Children with mental and physical handicaps* by J. E. Wallace Wallin; *Basic theories of physics* by Peter G. Bergmann; and *Structure and development of the vertebrates* by Florence Moog.

The Rayoscope (Booth 30). The Rayoscope exhibit this year will consist of the regular De Luxe Rayoscope—a microprojector—together with special models of the unit which have been developed especially for use with polarized light phenomena as well as many other specific uses. There will be offered a special circular rotatable

and centerable stage which has degrees of rotation marked so that amount of rotation can be easily determined. This stage has a separate centering bearing and rotating bearing. There will be exhibited a special model of the Rayoscope which uses its own screen on which images may be projected and various methods of measurement done with ease. Of course there will be the striking projection of live materials and life processes such as circulation of blood and heart beat. The Rayoscope has now been developed to the point where it is fool-proof and easily operated. This, together with portability, durability, absence of bothersome adjustments and servicing, makes the unit a worthwhile addition to any laboratory where an ordinary microscope is used. Look for the booth with the Neon Sign, "RAYOSCOPE." Meet us there.

Rinehart & Company, Inc. (Booth 20). Rinehart & Company, Inc., publishers, are represented by a display of outstanding texts in chemistry, physics, mathematics, psychology, education, and anthropology. The display also includes a number of technical and radio books published under the imprint of Murray Hill Books, Inc., a subsidiary of Rinehart. Visitors are cordially invited to examine these books at Booth 20, Annual Science Exposition.

The Ronald Press Company (Booth 84). Representatives of The Ronald Press Company will be on hand to welcome visitors to its booth in the Annual Science Exposition at the Hotel Statler. The display will include a varied selection of books on the biological and physical sciences, mathematics, engineering, psychology, and related fields. Information about important publications to be issued during 1950 will be available to the visitors.

W. B. Saunders Company (Booth 1). W. B. Saunders Company, Philadelphia, cordially invites you to visit its exhibit booth where you may examine select books in the biological sciences, chemistry, health, medicine, and surgery. Among the newer texts are *The vertebrate body* by Alfred S. Romer; *Principles of animal ecology* by Allee, Emerson, Park, Park and Schmidt; *College zoology* by Hunter and Hunter; *Principles of organic chemistry* by John L. Abernethy; *Theory and practice of quantitative analysis* by Clark, Nash and Fischer; *General endocrinology* by C. Donnell Turner; and *General cytology* by De Robertis, Nowinski, and Saez. Also on display are the new revised editions of the standard texts, *Fundamentals of bacteriology* by Martin Frobisher, Jr.; *Fulton's Textbook of physiology*; *Jordan-Burrows' Textbook of bacteriology*; *Clinical biochemistry* by Cantarow and Trumper; and *Public health and hygiene* by Bolduan and Bolduan; and many other outstanding texts and reference books. Saunders' representatives present are Tyler Buchenau, Clarence Wheeler, James Hughes, Paul Schneider, E. E. Holland, and E. R. Zieber.

Schwarz Laboratories, Inc. (Booth 43). Schwarz Laboratories, Inc. of 202 East 44th Street, New York, New York, consulting chemists and manufacturers of fine chemicals and chemotherapeutic agents, will exhibit samples of their products. Included will be their well-known

yeast nucleic acid and derivatives, as well as other biochemicals useful in research and clinical investigations. Recently added chemicals, such as malononitrile, desoxyribonucleic acid, adenosine-5-phosphoric acid, and the new phosphorylated sugar compounds, barium phosphoglyceric acid, fructose-6-phosphate, and glucose-1-phosphate will also be displayed. Any requirements for Schwarz fine chemicals, as well as technical information, will gladly be discussed by our representatives. Our services for problems in food technology will be offered and details given as requested.

Science Library (Booths 73 and 74). The Science Library is administered by the AAAS as an additional service to publishers of books, both exhibitors and non-exhibitors. It has become an integral part of each year's Annual Science Exposition. In the Science Library, books of all publishers are grouped by fields of science, a convenience both to the visitor who is restricting his inspection of books to one category—and to the one who wishes to browse. Among the publishers represented in the Science Library are:

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE	HENRY HOLT AND COM- PANY, INC.
ACADEMIC PRESS, INC.	HOUGHTON MIFFLIN COMPANY
ANNUAL REVIEWS, INC.	IOWA STATE COLLEGE PRESS
APPLETON-CENTURY- CROFTS, INC.	ISLAND PRESS COOPERATIVE, INC.
BLAKISTON COMPANY	LEA & FEBIGER
BURGESS PUBLISHING COMPANY	J. B. LIPPINCOTT COMPANY
CAMBRIDGE UNIVERSITY PRESS	THE MACMILLAN COMPANY
CHEMICAL EDUCATION PUBLISHING CO.	McKNIGHT AND McKNIGHT
CHEMICAL PUBLISHING COMPANY, INC.	C. V. MOSBY COMPANY
COLUMBIA UNIVERSITY PRESS	NEW YORK ASSOCIATION OF BIOLOGICAL SCIENCE
COMSTOCK PUBLISHING COMPANY	THOMAS NELSON AND SONS
CRANBROOK INSTITUTE OF SCIENCE	OXFORD UNIVERSITY PRESS
DODD, MEAD & COMPANY	PHILOSOPHICAL LIBRARY
THOMAS Y. CROWELL COMPANY	PITMAN PUBLISHING CORPORATION
W. H. FREEMAN & COMPANY	REINHOLD PUBLISHING COMPANY
GARLAN PUBLICATIONS	RINEHART & COMPANY
HARPER & BROTHERS, PUBLISHERS	SCOTT, FORESMAN AND COMPANY
HARVARD UNIVERSITY PRESS	STANFORD UNIVERSITY PRESS
D. C. HEATH & COMPANY	CHARLES C. THOMAS
	FREDERICK UNGAR PUB- LISHING CO.
	UNIVERSITY OF CHICAGO PRESS
	VIKING PRESS
	JOHN WILEY & SONS, INC.
	YEAR BOOK PUBLISHERS

Scientific American (Booth 79A). *Scientific American*: An entirely new monthly magazine of the sciences, published under the 105-year-old name. Original articles by workers in all branches of science. Addressed to scientists, engineers, physicians, and to interested and edu-

ated laymen. The Editors will be available for consultation during the convention. Inquire at booth or telephone LOngaere 4-0330. Orders will be accepted at the booth for reprints, back issues, and new subscriptions. Address mail inquiries to The Editors, *Scientific American*, 24 West 40th Street, New York 18, N. Y.

Ivan Sorvall, Inc. (Booth 82). The exhibit of Ivan Sorvall, Inc., will feature chiefly the Servall Angle Centrifuges, of which many variations will be on display. This company has pioneered the use of the angle principle in centrifugation, first introduced to laboratories in 1929, thus paving the way for the further development of high speed centrifuges. Present models range from a small clinical machine, carrying ten 15-cc. tubes, to a large capacity machine for four 500-cc. bottles. Of particular interest is a new vacuum-operated centrifuge of 800-cc. capacity, operated at 16,000 rpm. top speed. All models are available with refrigerators. Also on display is the Sterling Automatic Pipettes, chiefly used for dispensing accurately at a rapid rate small amounts of aqueous solutions, in routine laboratory work. This company also manufactures and distributes the Servall Magnetic Stirrers with new fusiform glass-encased stirring elements, and distributes the Original-Odhner Calculators, claimed to be "the machine to count on"—a handy and low priced calculator for the scientist.

E. R. Squibb & Sons (Booth 10). **Vitamin B₁₂ Exhibit:** The exhibit will portray the studies which led to the discovery of vitamin B₁₂, the development of suitable therapeutic products and the importance of the factor for man and animals. Many investigators working independently after years of experimenting found that liver contained a substance which played an important role for humans, animals, and microorganisms. Before the isolation of this substance, which was named vitamin B₁₂, it was called the antipernicious anemia factor as applied to humans, the *Lactobacillus lactis* Dorner (LLD) factor and the animal protein factor (APF). The workers in the three fields contributed heavily to the isolation of the vitamin. Although some of these names may have wider meanings, there appears to be little doubt that vitamin B₁₂ is an important hematopoietic factor for man and a growth factor for animals and certain microorganisms.

Sugar Research Foundation, Inc. (Booth 9). A general selection of Sugar Research Foundation material, scientific reports, and technological information will be available. The Foundation has a number of colored wall charts suitable for primary and secondary general science classes, a strip film on the subject of photosynthesis, and pamphlets on the growth and production of sugar from both cane and beet plants. Sugar Research Foundation sponsors research projects through grants-in-aid to specialists in nutrition, physiology, medicine, dentistry, and biological and organic chemistry. A summary of the six-year program is contained in a directory—*Research in review*.

Tech Laboratories, Inc. (Booth 83). The exhibit illustrates the three main lines of instruments manufac-

tured by the Tech Laboratories, Inc., as follows: (A) a falling ball viscosity meter based upon Stokes's Law, and with electronically timed operation; (B) a line of moisture meters for measuring the moisture content of wood, paper, textiles, dried food products, etc.; (C) a new electrocardiograph of greatly improved design. This instrument is available in two distinct models, viz.: one for general practice and the other for research and laboratory work. The instrument uses an oscilloscope and comes with a special camera for taking permanent records.

The Technicon Company (Booths 2 and 3). This exhibit will again feature the Technicon Automatic Fraction Collector, a fully automatic machine which collects up to two hundred rigidly controlled samples of predetermined fluid volumes. Also featured will be the new Technicon Microscope Lamp, a radical departure from the time-honored conception of microscope lamp design. This will be of great interest to all serious microscopists. Visitors to the Technicon Booth will also have an opportunity to inspect the Autotechnicon, an automatic tissue-processing machine; the Scopicon, a microscopic projector; and the various Lab-Aid Cabinets for slide filing. The Technicon Automatic Pipette Washer, the Technicon Microslide Dryer, the new, improved Technicon Paraffin Knife, and the Technicon Constant Temperature Water Bath will round out the exhibit of Technicon Laboratory Aids.

Arthur H. Thomas Company (Booth 68). On display at the exhibit of the Arthur H. Thomas Company will be: The Miller Kymograph, Small Model (one second contact intervals); Kymograph Miller No. O; Interval Timers (contact intervals one-fifth, one, three, or six seconds) electric motor driven; a Graphic Time Marker; and the Eberbach Electronic Stimulator, a compact, self-contained unit which provides a wide range of repeated, controlled, square wave pulses of fixed duration for physiological and pharmacological experiments and demonstrations.

Tracerlab, Inc. (Booth 37). The Tracerlab exhibit will feature the basic instruments required for a radioactivity laboratory, including the various types of scalers such as the Autoscaler, the "64" Scaler and the new "100" Scaler. Radiation survey meters, using both ionization chamber detectors and Geiger tubes will be demonstrated as well as thin mica end window Geiger tubes, all-glass Geiger tubes and beryllium window tubes suitable for counting x-rays. Other equipment including remote pipetting devices, remote handling tongs, lead bricks, film badges, and miscellaneous specialized equipment for the radioactivity laboratory will be on exhibit.

Triarch Botanical Products and Histoslides Company, Inc. (Booth 77). Dr. George H. Conant of Triarch Botanical Products, Ripon, Wisconsin, and Dr. J. B. McCormick of Histoslides Company, Inc., Chicago, Illinois, have combined their efforts for the 1949 AAAS Science Annual Exposition. We are presenting a booth that will display the finest prepared microslides for the fields of botany, histology, parasitology, and related sciences. You will find in our booth many new and inter-

esting slides that have been prepared by superior techniques for discriminating teachers. These slides will be demonstrated on standard microscopes at your pleasure and convenience. If you are interested in anatomical and other models as teaching aids in science we would suggest that you stop to see and inspect an entirely new and interesting series of models prepared by the Histoslide Company, Inc. These models are displayed for the first time and your reaction to them will determine how many additional models will be made available in the future. Dr. Conant and Dr. McCormick look forward to making new friends and renewing acquaintances.

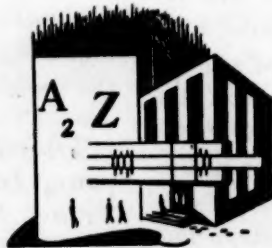
University Presses (Booths 25 and 26). Distinguished for authoritative content and excellence of editorial work, the books of university presses claim enviable rank among nonfiction and technical publications. The American Association of University Presses has arranged a cooperative exhibit for your enjoyment at this meeting—and to give you an opportunity to purchase some of the important titles for your library. Books from the following university presses will be displayed: California, Cambridge, Chicago, Columbia, Cornell, Harvard, Illinois, Iowa, Johns Hopkins, Michigan, Oklahoma, Pennsylvania, Princeton, Rutgers, Stanford, Washington, Wisconsin, and Yale.

D. van Nostrand Company, Inc. (Booth 72). A collection of the newest Van Nostrand publications in the fields of chemistry, nuclear science, biochemistry, physics, biology, and zoology will be featured. Some of these titles include: *Radioactive tracer techniques* (Schweitzer and Whitney), *Crystals and x-rays* (Lonsdale), *Introduction to biochemistry* (Williams and Beerstecher), *Theory and design of electron beams* (Pierce), *Instrumental methods of analysis* (Willard, Merritt and Dean), *Fundamentals of qualitative chemical analysis* (McAlpine and Soule), *A simplified course in elementary qualitative analysis* (Hartsuch), *Introductory biology* (Stauffer), and *Biology and its relation to mankind* (Winchester). In addition, there will be displayed a general line of standard science texts published by Van Nostrand. The display will be housed in a special new traveling unit which Van Nostrand is using for book exhibits.

Ward's Natural Science Establishment, Inc. (Booths 40 and 41). A special feature of the Ward exhibit will be a display of all the new Mueller-Ward and Wilson-Ward models. The new Mueller-Ward models include anatomical-histological models of the liver, kidney, bone, and muscle. The Wilson-Ward line includes models depicting the development of the human face and the development of the human heart. There will also be a complete display of specimens embedded in Ward's Bioplastic. A demonstration of the method of embedding will be made. Other new developments will also be displayed.

W. M. Welch Manufacturing Company (Booths 61 and 62). Featured by the W. M. Welch Manufacturing Company—physical, chemical, and biological instruments and teaching aids—will be new mathematics models; atomic structure model; demonstration radio transmitting and receiving panels; demonstration cathode ray; electronic voltage regulator; and Densichron—an electronic light intensity meter. Other instruments include voltmeters, ammeters, wattmeters, and ohmmeters, a-c and d-c, and demonstration equipment for mechanics, heat, electricity, sound, and light. Charts on display include single charts on "Electromagnetic Waves," "Periodic Table," "Atomic Structure," "Organic Chemistry," and "Isotopes"; and sets of charts for teaching botany, zoology, physiology, aeronautics, and physics.

John Wiley & Sons, Inc. (Booth 6). John Wiley & Sons, Inc., New York, scientific and technical book publishers, is displaying in Booth 6 a comprehensive collection of recent and standard books in various fields of pure and applied science. While stress will be placed on 1949 books, Wiley plans to show a full range of titles which have earned recognition as outstanding texts, manuals, handbooks, or other works of reference. Many of these will be found in new, revised editions. Fields of interest covered include aeronautics, agriculture, anthropology, astronomy, the biological sciences, chemistry, education, the earth sciences, mathematics, public health, physics, psychology, social and political science, and business. Examples of the Wiley visual aids program will be a special feature of the exhibit.



Association Finances

Howard A. Meyerhoff, *Administrative Secretary*

The ensuing condensed statements of Association finances during the years 1946, 1947, and 1948 were prepared by the auditing firm of G. P. Graham & Company and are published herewith, pursuant to a vote of the Executive Committee, in order that the membership may be fully informed regarding the Association's current financial condition.

The first three statements summarize operating receipts and expenditures. It will be noted that, during 1946, the excess of receipts over expenditures was only \$10,677, prior to annuity and inflation payments of \$22,992 toward the purchase of *Science* and \$4,300 for other disbursements. Of the \$81,360 shown as the balance of unallocated funds on January 1, 1946, \$80,180 was transferred to the Building Fund to complete the purchase of the Scott Circle property. From the precarious situation which resulted at the end of 1946, improvement in the operating balance and replenishment of the Unallocated Funds have been effected by the increase in dues from \$5.00 to \$6.50, by increased income from advertising and journal subscriptions, and by payment of the 1947 *Science* annuity and inflation allowance from the Treasurer's Funds.

The second series of statements summarizes the status of the Treasurer's Accounts, which include the modest

endowment, property holdings and special funds administered by the Association. The list of disbursements gives some idea of the ramified activities for which these funds are used and indicate the expanded service the Association might render if the endowment can be increased.

September 15, 1949

To the Council of the
American Association for the Advancement of Science
Washington, D. C.

We have examined the balance sheet of the Operating Fund of the American Association for the Advancement of Science as at December 31, 1948, and the statement of receipts and expenditures for the years ended December 31, 1946, 1947 and 1948. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements as supplemented by the notes thereto present fairly the financial position of the Operating Fund of the American Association for the Advancement of Science as at December 31, 1948, and the results of its operations for the three year period ended thereon.

G. P. GRAHAM & COMPANY
By H. A. O'NEILL

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE OPERATING FUND

BALANCE SHEET AS AT DECEMBER 31, 1948

ASSETS			
Current assets			
Cash	\$350,850.16		
Accounts receivable	15,452.69	\$366,302.85	
		<u>\$366,302.85</u>	
LIABILITIES			
Current liabilities			
Accounts payable		\$ 27,123.53	
Deferred income			
Prepaid dues and fees	\$198,694.00		
Prepaid journal subscriptions	46,006.16	244,700.16	
		<u>94,479.16</u>	
Unallocated funds (net worth)		<u>\$366,302.85</u>	

Note: The journal *Science* was acquired in 1944 at a stated cost of \$166,430.69, payable over a period of ten years, together with such additional as may be determined each year under the inflation clause in the contract. Total payments to December 31, 1948 amounted to \$118,299.28. No liability has been shown on the above statement for the balance of \$84,140.11 which is payable on the stated cost price of the journal.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
OPERATING FUND

STATEMENT OF RECEIPTS AND EXPENDITURES FOR THE YEARS ENDED DECEMBER 31, 1946, 1947 AND 1948

RECEIPTS	1946	1947	1948
Dues and entrance fees	\$135,382.00	\$153,546.72	\$234,714.73
Journals			
Subscriptions			
From Treasurer's account (life, 50-year and emeritus members)	1,851.00	1,785.00	2,659.50
Members special subscriptions	7,149.00	7,242.00	13,392.75
Non-member subscriptions	35,304.52	41,627.02	50,147.07
Advertising	85,938.85	121,900.11	116,742.84
Miscellaneous sales, etc.	1,983.61	1,834.71	8,115.42
Publications			
Symposium volumes		8,413.34	8,492.15
Proceedings and directory	50.50	9,140.00	22,647.23
Meetings and exhibits	29,181.25	27,404.25	9,768.55
Rental income	1,587.82	3,695.24	3,150.44
Miscellaneous	232.02	2,635.16	815.72
	<u>\$298,660.57</u>	<u>\$379,223.55</u>	<u>\$470,646.40</u>
EXPENDITURES			
Administrative and general expense	\$ 47,291.92	\$ 47,913.55	\$ 58,595.31
Building expense	2,784.43	2,524.18	4,272.71
Executive committee	1,525.18	2,899.77	2,748.12
General secretary	385.48	762.55	750.00
Allowance to divisions	3,699.00	4,384.00	5,183.00
Section expenses	1,311.31	1,691.23	1,455.73
Circularization—new members	1,492.51	4,387.63	26,476.34
Meetings and exhibits	4,865.76	24,219.63	21,432.91
Journals	189,298.99	196,251.98	256,272.26
Publications	33,433.06	18,597.75	42,730.72
Employees' retirement plan			4,723.67
Miscellaneous	1,895.83	2,287.99	1,773.61
	<u>\$287,983.47</u>	<u>\$305,920.26</u>	<u>\$426,414.38</u>
EXCESS OF RECEIPTS OVER EXPENDITURES	<u>\$ 10,677.10</u>	<u>\$ 73,303.29</u>	<u>\$ 44,232.02</u>

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
OPERATING FUND

ANALYSIS OF UNALLOCATED FUNDS (NET WORTH)
JANUARY 1, 1946 TO DECEMBER 31, 1948

Balance as at January 1, 1946			\$ 81,360.91
Add:			
Excess of receipts over expenditures			
1946	\$10,677.10		
1947	73,303.29		
1948	44,232.02	\$128,212.41	
Transfer from reserve for symposium publications as directed by Executive Committee (1947)		17,354.06	
Payments received from Trustees of Estate of James M. Cattell in full settlement of claim affecting prior year (1947)		3,284.83	148,851.30
			<u>\$230,212.21</u>
Deduct:			
Amounts paid on Woodley and Stephenson claims and attorney's fee incident thereto ...		\$ 4,300.00	
Amount transferred to building fund—			
Treasurer's account		80,180.81	
Science annuity payments			
1946	\$16,643.04		
1948	16,643.04	33,286.08	
Inflation allowance on annuity			
1946	\$ 6,349.32		
1948	11,616.84	17,966.16	135,733.05
Balance as at December 31, 1948			<u>\$ 94,479.16</u>

Note: The 1947 Science annuity and inflation allowance thereon were paid from the Treasurer's accounts.

To the Council of the
American Association for the Advancement of Science
Washington, D. C.

We have examined the balance sheet of the Treasurer's accounts of the American Association for the Advancement of Science as at December 31, 1948, and the statement of cash receipts and disbursements for the three year period then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other

auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet as at December 31, 1948, and statement of cash receipts and disbursements present fairly the financial position of the Treasurer's accounts of the American Association for the Advancement of Science at that date, and the cash receipts and disbursements for the three year period then ended.

G. P. GRAHAM & COMPANY

By H. A. O'NEILL

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

TREASURER'S ACCOUNTS

BALANCE SHEET AS AT DECEMBER 31, 1948

ASSETS

Endowment and reserve funds		
Cash awaiting investment	\$ 10,875.74	
Securities	236,645.64	\$247,521.38
Building fund		
Cash	\$ 23,420.90	
Securities	648.20	
Real estate	153,297.20	177,366.30
Current funds		
Cash		20,997.81
		<u>\$445,885.49</u>

LIABILITIES AND RESERVES

Endowment and reserve funds		
For research	\$118,366.15	
For general purposes	104,617.25	
For special purposes	9,025.00	
Treasurer's reserve fund	15,512.98	\$247,521.38
Building fund		
Contributions from members, etc.	\$ 97,185.49	
Transfer from Operating fund	80,180.81	177,366.30
Current funds		
Liabilities		
Thousand dollar prize fund	\$ 2,000.00	
Special academy grants	400.00	
Westinghouse science writers award fund	1,153.44	
AAAS—UNESCO fellowship fund	53.50	
Academy grants	2,524.75	\$ 6,131.69
Unappropriated income		
For research	\$ 3,348.23	
For general purposes	2,929.70	
Unallocated	235.16	
Jane M. Smith fund	1.09	
Luella A. Owen fund	13.95	
A. G. Stillhamer fund	538.98	
Unexpended balances of previous years	7,799.01	14,866.12
		<u>20,997.81</u>
		<u>\$445,885.49</u>

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

TREASURER'S ACCOUNTS

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS JANUARY 1, 1946 TO DECEMBER 31, 1948

Cash balances January 1, 1946			\$ 38,132.40
Receipts			
Endowment and reserve funds			
Life membership fees			
Regular	\$ 4,700.00		
Emeritus (Jane M. Smith fund)	4,500.00		
Income added to reserve fund	2,259.13		
Redemption and sale of securities	180,462.18	\$191,921.31	
Building fund			
Amount due from Operating fund Jan. 1, 1946	\$ 48,604.36		
Contributions	47,241.63		
Liquidating dividend on securities	700.00		
Income from securities	54.15		
Transfer from Operating fund	80,180.81	176,780.95	
Current fund			
Contributions for special academy grants	\$ 950.00		
Westinghouse science writers award fund	14,574.94		
AAAS—UNESCO fellowship fund	53.50		
Deceased emeritus life membership fees—Transferred from endowment fund	2,000.00		
Thousand dollar prize fund	2,000.00		
Net income from securities	20,437.30	40,015.74	408,718.00
			\$446,850.40
Disbursements			
Endowment and reserve funds			
Securities purchased	\$166,433.93		
Deceased emeritus life membership fees—Transferred to Jane M. Smith fund income	2,000.00		
1947 Science annuity and inflation allowance thereon (Note A)	26,279.36	\$194,713.29	
Building fund			
Cost of properties and additions	\$153,297.20		
Miscellaneous expenses and refunds	61.05	153,358.25	
Current fund			
Westinghouse science writers award fund	\$ 20,899.00		
Special academy grants	600.00		
Thousand dollar prize fund	2,000.00		
Emeritus life members (Jane M. Smith fund income)	4,500.00		
Income allocated to Treasurer's reserve	2,259.13		
Academy grants	6,866.75		
Journal subscriptions (Life, 50-year and emeritus members) ..	6,295.50		
Miscellaneous expenses	64.03	43,484.41	391,555.95
Cash balances December 31, 1948			
For investment		\$ 10,875.74	
For building fund		23,420.90	
For current purposes		20,997.81	\$ 55,294.45

Note: (A) Science annuities and inflation allowances thereon for the years 1946 and 1948 were paid from the Operating fund of the Association.

TECHNICAL PAPERS

The Antitreponemal Effect of Oral Chloromycetin¹ in 32 Cases of Early Syphilis in Man—A Preliminary Report

Monroe J. Romansky, Sidney Olansky,
S. Ross Taggart, and Eugene D. Robin

Department of Medicine, George Washington
University School of Medicine, and
Gallinger Rapid Treatment Center,
Bureau of Venereal Disease,
Washington, D. C.

Chloromycetin (Chloramphenicol) was originally isolated from a soil organism, *Streptomyces venezuelae* (1). This antibiotic has been shown to have a wide range of therapeutic activity against many pathogenic organisms.

A systematic study of its use in the treatment of human

syphilis has not yet been reported. However, it has been used by Smith and co-workers (4) in the treatment of experimental rabbit syphilis. These workers found that after dosages of 50 and 100 mg/kg of body wt the syphilitic lesions were cleared only temporarily of treponema.

Smadel and associates (3) reported that a single oral dose of chloromycetin would cure a high percentage of acute gonorrheal urethral infections. They suggested that chloromycetin might not have the effect of masking syphilitic infections and thus might be more desirable than penicillin for the treatment of gonorrhea.

Since the use of chloromycetin in the treatment of gonorrhea has been reported and since it seemed to have some antitreponemal activity in rabbit syphilis, we decided to study its effect upon the treponema of human syphilis.

Patients with lesions containing numerous *Treponema pallidum* were selected for this study. The first four cases received 120 mg/kg of chloromycetin per day. Two of these received an additional priming dose of 4 g. The

TABLE 1
EFFECT OF CHLOROMYCETIN IN 25 CASES OF EARLY SYPHILIS IN MAN

No. of cases	Diag- nosis	Chlo- romy- cetin mg/kg /day	Days treat- ment	Total dose in g	Dark- field nega- tive in hr	Serologic titer				Remarks
						Before treat- ment	Months after treatment			
							1	2	3	
3	S*	120	6	56.0		1: 256	1: 4	NF†	1: 4	priming dose 4 g
	"			51.0	22-26	1: 128	1: 64	NF	NF	
	"			56.0		1: 128	2 +	neg	NF	
3	S	60	6	44.5	23-24	1: 512	1: 64	1: 16	1: 8	
	P†			18.0		neg	neg	neg	neg	
	"			27.0		neg	neg	neg	neg	
19	S	30	4, 6, or 8	20.5		1: 1024	1: 128	1: 32	NF	
	"			10.5		1: 256	1: 64	NF	NF	
	"			18.5		1: 256	1: 16	NF	NF	
	"			10.5		1: 128	1: 32	1: 4	NF	pregnant
	"			16.0		1: 128	1: 64	NF	NF	
	"			12.0		1: 128	1: 16	1: 16	NF	
	"			12.0		1: 128	1: 128	1: 128	NF	
	"			12.0		1: 64	1: 32	1: 4	NF	
	"			12.0		1: 64	1: 16	1: 4	NF	
	"			12.0		1: 64	2 +	neg	NF	
	P			27.5	22-28	3 +	neg	NF	NF	12 g on 1st day
	"			12.0		neg	neg	neg	NF	
	"			22.0		neg	neg	neg	NF	15 g on 1st day
	"			22.0		neg	neg	neg	neg	12 g single dose on 1st day
	"			18.0		neg	neg	neg	neg	
	"			8.0		neg	NF	neg	NF	
	"			12.0		neg	neg	neg	NF	pregnant
	"			8.0		neg	neg	neg	neg	
	"			8.0		neg	neg	NF	NF	
25	(total)									

* Secondary syphilis.

† Primary syphilis.

‡ NF indicates no follow up.

¹The chloromycetin (Chloramphenicol) used in this study was obtained through the courtesy of Parke, Davis & Company, Detroit, Michigan.

next four patients received 60 mg/kg/day, and the remaining 24 received 30 mg/kg/day. Except in a few instances the antibiotic was administered orally in six equal doses at 4-hr intervals. Table 1 summarizes the treatment schedules and clinical and laboratory data of

25 of the patients treated. Seven additional patients were treated but could not be followed up.

Treponema were not found in the lesions of the first four cases 22-26 hr after treatment was started. The treponemal disappearance time in the next four patients was 23 hr. Two cases given 30 mg/kg/day were negative in darkfield microscopic examination in 26 hr.

Since there was rapid disappearance of the treponemas from the local lesions on a relatively large dose it was decided to investigate the minimal effective dose of the antibiotic. A single oral dose of 250 mg was given to three cases, the lesions remained positive for treponema in darkfield examination even at 48 hr. Two cases were given 500 mg in a single oral dose; the lesions in one became negative in darkfield examination in 48 hr, and the other remained positive even at 96 hr. In these cases treatment was subsequently instituted on a 30 mg/kg/day schedule for 6 days with complete healing of the lesions.

In order to determine whether the treponemal disappearance time could be decreased, one case was given 2 g every 4 hr for six doses, a second case 2.5 g every 4 hr for six doses, and a third case 12 g as a single dose; the treponemal disappearance time was 24, 26, and 24 hr, respectively. Apparently increasing the dose of chloromycetin does not appreciably shorten the treponemal disappearance time.

These findings suggested that an oral chloromycetin dosage of 30 mg/kg/day divided into six doses and given at 4-hr intervals might be effective in the treatment of early syphilis. Therefore, a total of 24 patients were treated with 30 mg/kg/day for 4, 6, or 8 days. The lesions in all cases showed evidence of initial healing within 24 hr and most of them showed complete healing by the end of therapy. Some delay in healing occurred in a few cases where the location of the lesion predisposed to a slower response. For example, a patient with a urethral chancre took 6 days to heal because of the constant flow of urine over the lesion.

Chloromycetin seems to us to promote healing by a different mechanism from penicillin. Penicillin produces initial healing at the periphery of a lesion, whereas healing with chloromycetin therapy seems to be initiated from the base of the lesion. This is particularly striking in the large ulcers of benign late syphilis of the skin.

Quantitative serologic tests using the Eagle Flocculation Test for syphilis were performed prior to therapy and at monthly intervals after treatment. It is noted in the table that there is a rapid decline in serologic titer in most cases at the end of one month following treatment.

Two of the patients who received 30 mg/kg/day were pregnant. The clinical and serological response until now has been satisfactory in both patients. One patient has delivered a live child. Although serologically positive at birth, clinical and serologic progress in this child have been excellent without further therapy. The second patient is still pregnant.

The only toxic or untoward reactions noticed with the dosages of chloromycetin utilized in this study were an occasional mild diarrhea and an occasional complaint of dryness of the mouth. The Jarisch-Herxheimer reaction

in chloromycetin-treated patients is either less frequent than that observed in penicillin-treated cases or of such a mild nature that it is frequently missed. Only two patients were observed to have very mild reactions 48 hr after treatment was started. Several patients complained of a generalized aching sensation 48 hr after treatment began, but no fever or eruptions were noted. As these symptoms disappeared in 8-12 hr, despite further therapy, they may have been Jarisch-Herxheimer reactions.

Since relatively small doses of chloromycetin will cure acute gonorrhea, (2, 3) attention should be called to the possible danger of masking the diagnosis of syphilis.

Studies with the use of chloromycetin for the treatment of syphilis are continuing, and are being extended to include the late manifestations of syphilis. One patient with late syphilis manifested by extensive gummata of the leg is now under therapy with chloromycetin. This patient has had a dramatic healing response within 4 days after treatment was started.

References

1. EHRLICH, J. *et al.* *J. Bact.*, 1948, **56**, 467.
2. GREAVES, A. B. *et al.* To be published.
3. SMADEL, J. E., BAILEY, C. A., and MANKIKAR, D. S. Presented before Second National Symposium on Recent Advances in Antibiotic Research, Washington, D. C., April, 1949.
4. SMITH, R. M. *et al.* *J. Bact.*, 1948, **55**, 425.

Effect of Pressure on Induction of Mutations by Nitrogen Mustard¹

William D. McElroy and Gabriel de la Haba

Department of Biology,
The Johns Hopkins University, Baltimore, Maryland

An analysis of the mechanism of action of mutagenic agents depends, for the most part, upon indirect experimental methods (1). By studying changes in the mutation rate under varying experimental conditions, such as temperature and pH, it has been possible to obtain some idea as to the general stability of genes. Since nucleoproteins are apparently the most important components of the chromosome (5) (and presumably of the genes), it is likely that structural changes in these molecules underlie the basic alterations involved in gene mutation. Such structural changes might be of the order of magnitude observed by Johnson, Eyring, and collaborators in protein denaturation (14). Since pressure has been used successfully in the analysis of such equilibria or rate processes by these workers, it seemed to the authors that a similar study of the effect of pressure on the mutagenic action of the nitrogen mustards would aid materially in interpreting the results which have been obtained with these and similar agents. According to the general expressions which have been derived for a quantitative interpretation of the effect of pressure on biological processes (8), it should be possible to determine the magnitude of the volume change which occurs during the reaction that results in a gene mutation.

¹ Supported in part by a grant from the National Institutes of Health.

A series of experiments have been performed to determine the effect of high hydrostatic pressure on the induction of both morphological and biochemical mutants in *Neurospora crassa* by nitrogen mustard. The results, summarized in Table 1, clearly show that application of high pressure to a conidial suspension containing nitrogen mustard depresses the number of morphological mutants obtained ($P < .001$). The reduction of the mutation rate is directly proportional to the pressure applied. With 9,000 lb per sq in. (psi), the rate of morphological mutation is reduced approximately 45–50%, while with 5,000 psi the rate is reduced approximately 30–35%. A few experiments performed at a pressure of 2,000 psi indicate that approximately 10% reduction occurs at that pressure. A record of the different types of morphological mutants which occurred was kept, and the results indicate that no particular sort of mutant was suppressed by the high pressure. The mutants recovered after subjection to mustard plus 9,000 psi were of the same general types as those recovered after treatment with mustard at normal atmospheric pressure. Results obtained with different pressures may be compared, therefore, on a rate basis.

By making use of the following general equation, the volume change of a reaction can be determined by plotting the \ln of the velocity constant against pressure:

$$\left(\frac{d \ln K}{dp}\right)_T = \frac{\Delta V}{RT}$$

From a plot of the \ln of the morphological mutation rate against pressure, the present data indicate that an average volume change for the individual event occurring in the chromosome is approximately 70 cm³ per mole, a volume change which is similar to that found for denaturation of serum globulin (11), for inactivation of specific antitoxin (12, 13), and for specific precipitation (4).

Pressure appears to have an opposite effect to that just described when, instead of morphological mutants, chemical mutants induced by nitrogen mustard are tabulated. In all experiments there is a consistent increase in the number of biochemical mutants obtained when pressure is combined with nitrogen mustard. On the basis of kinetic analysis this relationship indicates that changes which result in the formation of a biochemical mutant proceed with a decrease in volume. Additional experiments will be necessary to establish this point definitely.

The differential effect of pressure on the induction of morphological and biochemical mutants by nitrogen mustard is of particular interest because it confirms previous indications that these two types of mutants are different in nature. Experiments combining the effects of ultraviolet radiation and nitrogen mustard have shown that a difference between these two types of mutants exists (15). A large percentage of the morphological mutants are sterile, a fact indicating that probably the phenotypic effect is due to gross chromosomal changes; whereas biochemical mutants, on the other hand, usually require single growth factors and have been shown, in many cases, to be due to single gene changes (3). It is not surprising that pressure has such a marked effect on the rate of morphological mutations if most of them are due to chromosomal breaks. Such rearrangements of the nucleo-

proteins would be expected to be accompanied by large volume changes. It should be emphasized that although our results show a significant decrease in the number of morphological mutants at high pressure, the percentage of viable spores is not significantly altered. This indicates that the killing action of the mustard is not inhibited by the pressure.

The possibility that cross-linking plays a role in the action of mustard gas has been suggested (6, 10). Elmore *et al.* have found that the number of blocked titratable groups in thymus nucleic acid is greater than the number of mustard gas residues in the molecule. Their results indicate that the mustard gas molecule reacts with two titratable groups either in the same molecule or, by cross-linkage, between different polynucleotide chains. The increased viscosity they observed in the treated sample also suggested the existence of intermolecular cross-linkages. Goldacre *et al.* further suggested that nitrogen mustards produce their effects by interchromatid cross-linkages, which result in fragmentation and consequently in rearrangement. It seems likely that such extensive rearrangements of the nucleoproteins in the chromosome as that which results after treatment with nitrogen mustards may be the basis of the morphological effect observed in subsequent generations. Furthermore, it is to be expected that these particular reactions would be accompanied by large volume changes and that pressure would influence the process significantly.

The effect of pressure on the process yielding biochemical mutations indicates that such an extensive rearrangement of genic material does not occur in this case. The evidence suggests, on the contrary, that such mutations are accompanied by a volume decrease, such as might be expected to occur with a simple bimolecular reaction (7). A more extensive analysis of the effect of pressure to include not only single gene mutations but also small deletions involving several genes must be of great interest. It may be that changes which result in a single gene mutation are greatly delayed and occur only at the time of the reduplication process. Combination of nitrogen mustard with groups at the surface of the chromosome or gene may perhaps take place with a small volume change; however, if the genes have to unfold in the reproduction process, as has been suggested (9), it is possible that exposure of new groups at that time to the attached nitrogen mustard molecule might greatly influence the unfolding process. Analysis of delayed effects of pressure should throw light on the nature of this process.

Experiments have been performed to determine whether pressure would have an effect if applied after mustard treatment. In these experiments treated spores were centrifuged and resuspended in phosphate buffer and immediately placed under pressure. If 9,000 psi are applied within 10–15 min after the treated spores have been resuspended in phosphate buffer, it is possible to reduce the number of morphological mutants by approximately 25%, in contrast to the 45–50% reduction observed when pressure is applied simultaneously with mustard. Thirty min after treatment the mutation process appears to have become irreversible insofar as morphological mutants are

TABLE 1
EFFECT OF PRESSURE ON INDUCTION OF MUTATIONS BY
NITROGEN MUSTARD IN *Neurospora crassa*
(TEMP = 26° C)

Exp. No.	Treatment	No. isolations	No. morph. mutants	% Mut.	No. bio-chem. mutants	% Mut.	% Kill
21	0.2% Mustard	357	53	14.9	3	0.8	99.57
	0.2% Mustard + 9000 psi	238	17	7.2	6	2.5	99.94
25	0.2% Mustard	396	45	11.4	4	1.0	99.29
	0.2% Mustard + 9000 psi	435	33	7.6	8	1.8	99.72
48	0.2% Mustard	423	82	19.4	8	1.9	....
	0.2% Mustard + 9000 psi	377	46	12.0	10	2.7	....
53	0.2% Mustard	329	49	15.0	..	..	....
	0.2% Mustard + 9000 psi	595	44	7.4	..	..	....
29	0.2% Mustard	323	27	8.3	..	..	98.27
	0.2% Mustard + 5000 psi	377	20	5.3	..	..	98.50
39	0.2% Mustard	513	63	12.3	4	0.8	....
	0.2% Mustard + 5000 psi	448	36	8.0	5	1.1	....
	None	400	5	1.4	0	0	....
	9000 psi	385	3	0.8	0	0	50.00

concerned, for pressure applied at that time has no appreciable effect. The results therefore indicate that there are temporary delayed effects of nitrogen mustard which can be influenced by application of high hydrostatic pressure.

From the type of temperature and pressure analysis which has been adequately outlined by Johnson, Eyring, and their co-workers, it should be possible to obtain a clearer understanding of the action of chemical agents and various types of radiation in inducing genic changes. The action of pressure on the combined effects of various mutagenic and nonmutagenic agents (N-mustard, x-ray, ultraviolet, and infrared radiation, etc.) may be expected to clarify greatly the process by which these environmental factors can modify the mutation process.

A microconidial strain of *Neurospora crassa*² (2) was used to study the effect of pressure on the induction of both biochemical and morphological mutants by nitrogen mustard, bis- β -chloroethylmethylamine. Eight-day-old conidia were suspended in 0.1 M phosphate buffer (pH 6.5) and filtered through a sterile pad of cotton in order to remove any mycelial fragments. After the desired treatment, the spores were plated onto a complete medium containing 1.5% L-sorbose (16). After 2-3 days, single isolates were transferred to small (10 x 75 mm) complete slants and subsequently scored for morphological mutations. These isolates were then transferred to a liquid minimal medium to determine the presence of any biochemical mutants. Most such mutants found involved deficiencies of single amino acids, vitamins, or purines.

The method used in applying high pressure to the conidial suspension was essentially that which has been

² Kindly supplied by Dr. E. L. Tatum.

described by Johnson *et al.* (14). The desired amount of an aqueous solution of nitrogen mustard was mixed with the conidial suspension, and a sample of the mixture was placed in the high pressure bomb. In those cases where pressure was applied simultaneously with the mustard, there was a lapse in time of approximately 30 sec between mixing of the mustard with the conidial suspension and application of the pressure. After treatment under high pressure, a sample of the mixed suspension was removed from the pressure bomb and rapidly plated onto the complete medium.

References

1. AUERBACH, C. *Biol. Rev.*, 1949, **24**, 355.
2. BARRATT, R. W., GARNJOBST, L., and TATUM, E. L. *Proc. 8th internat. gen. Congr., Suppl. Hereditas*, 1949.
3. BEADLE, G. W. and TATUM, E. L. *Amer. J. Bot.*, 1945, **32**, 678.
4. CAMPBELL, D. H. and JOHNSON, F. H. *J. Amer. chem. Soc.*, 1946, **68**, 725.
5. DE ROBERTIS, E. D. P., NOWINSKI, W.-W., and SAEZ, F. A. *General cytology*. Philadelphia: W. B. Saunders, 1948.
6. ELMORE, D. T. *et al.* *Biochem. J.*, 1948, **42**, 308.
7. EYRING, H. and STEARN, A. E. *Chem. Rev.*, 1939, **24**, 253.
8. EYRING, H. and MAGEE, J. L. *J. cell. comp. Physiol.*, 1942, **20**, 169.
9. EYRING, H., JOHNSON, F. H., and GENSLER, R. L. *J. phys. Chem.*, 1946, **50**, 453.
10. GOLDAIRE, R. J., LOVELASS, A., and ROSS, W. C. J. *Nature*, Lond., 1949, **163**, 667.
11. JOHNSON, F. H. and CAMPBELL, D. H. *J. cell. comp. Physiol.*, 1945, **26**, 43.
12. JOHNSON, F. H. and WRIGHT, G. G. *Proc. Nat. Acad. Sci.*, 1946, **32**, 21.
13. JOHNSON, F. H., BAYLOR, M. B., and FRASER, D. *Arch. Biochem.*, 1948, **19**, 237.
14. JOHNSON, F. H. and EYRING, H. *N. Y. Acad. Sci.*, 1948, **XLIX**, 376.
15. SWANSON, C. P., MCELROY, W. D., and MILLER, H. *Proc. nat. Acad. Sci.*, in press.
16. TATUM, E. L., BARRATT, R. W., and CUTTER, V. M. *Amer. J. Bot.*, 1948, **35**, 803.

A Prediction Regarding the Humboldt Current

Lalla R. Boone¹

University of California, Berkeley

According to a finding of the late E. G. Mears, an unusual ice outbreak was due in the North and South Atlantic during the proper seasons of 1949. The Humboldt Current should begin receiving warm water invasions by the southern summer of 1950, but these invasions should not become serious until 1951-52. Dr. Mears' attention was drawn to the Humboldt Current during the 1941 conference of scientists in Lima. In *Science* (16) of April 24, 1942, he pointed out that the 1941 tropical intrusion (9) into the normally subtropical Peru, did not correspond to the seven-year cycle (24), which had been proposed previously, for only two years had elapsed since the 1939 interruption had occurred. In Dr. Mears' subsequent study of the Humboldt Current, he became con-

¹ Research Assistant to E. G. Mears, 1940-1946.

fidant that the disastrous warm water visits to the coast of Peru are occasioned by tides, (5, 7, 12, 15, 18, p. 334, 23, 25, 26). They are connected with moon cycles (23, 25, 26) and are related to sunspot activity indirectly as the sunspots affect the moon (2, 19, 22, 23, 32, 33, 36).

Pettersson, of the Hydrographic Station of Borneo, has shown that tides at boundaries between deep and bottom waters of deep inlets during certain moon cycles are as much as fifty times greater (25, 26) than simultaneous tides at the surface. Therefore, even though polar region tides at the surface are small (12), in deep polar inlets tides at boundaries between deep and bottom waters may be very important, for Pettersson has proved (25, 26) that it is because of these tides that important ice outbreaks come from such inlets. He suggested in 1929 (26) that ice outbreaks from such inlets in the immediate antarctic vicinity of the Humboldt Current might cause the tropical irregularities in the Humboldt Current area. When Gunther (10) demonstrated that antarctic water had no part in the Humboldt Current either directly at the surface or from upwelling, and other *Discovery Reports* (4, 6, 8, 13, 14) made clear that only the Weddell Sea had an outlet sufficiently deep to emit significantly large quantities of ice (30, 35), it became apparent that Pettersson's suggestion needed to be amplified. Dr. Mears, in a manuscript he was preparing for publication when he died, stated that ice from the Weddell Sea seemed to fit known occurrences better than ice from the immediate antarctic vicinity of the Humboldt Current could, because there appeared to be a lag between ice outburst and abnormalities in the Humboldt Current area. If the ice discharge came into the immediate stream from which the Humboldt stems—the West Wind Drift—the lag of approximately a year between unusual ice conditions known in the antarctic and any disturbance in normal phenomena of the Humboldt Current area, and two to three years before serious interruption occurred, would be difficult to explain (23). This lag, if the significant ice discharge comes only from the Weddell Sea, would be necessitated by the long circuit which the body of water affected by the discharge from the Weddell Sea must make around the Antarctic Ocean to the American West Coast before it could affect the Humboldt Current environs.

That the ice discharge from the Weddell Sea is important is attested by Mackintosh and Herdman (14, p. 292): "The Weddell Sea has an important effect in the distribution of ice in the Atlantic sector . . . the flow of cold water from the Weddell Sea . . . exerts an influence far to the east. . . . The Ross Sea, which is shallow and has a less effective current system, has comparatively little influence on the ice beyond its immediate neighborhood." Deacon (6) stated that in the Weddell Sea deep and bottom water could be renewed from the surface. From the oxygen and mineral contents of the deep and bottom waters in the eastern Pacific area, Clowes (4) agreed with Deacon that the Weddell Sea appeared to be the only place, or the only significant place as far as the Southern Ocean Drift is concerned, where deep and bottom water can be renewed. Since ice conditions from the Weddell Sea affect the circumpolar drift significantly, and

conditions in the Weddell Sea can affect the oceanic water from the surface to the bottom, tides at the boundaries between deep and bottom water layers might affect surface water conditions and force unusual ice discharges from the Weddell Sea, even as Pettersson suggested. Dr. Mears suggested that an unusual discharge of ice and abnormal amounts of deep and bottom water from the Weddell Sea might affect, for the complete circuit of the drift, the portion of the circumpolar drift into which it was emitted. Since most of the deep and bottom water of the great polar drift does not seem to cross the South American submarine ridges, but apparently turns to the northward on approaching the American continent (1, 4, 6, 8, 14, 29, 34, 41), the Humboldt Current normally rides to the northward over a huge mass of generally northward-moving water (10). If this huge mass had unusual augmentations, such as Pettersson (25, 26) described as resulting from certain moon cycle tides in deep inlets, that huge mass might be crowded upward as it made its way northward between Easter Island Ridge (30, 38) and the coast of South America, in Thoulet's Easter Island Sea (38). As the crowded water pushes upward, everything above, including the Humboldt Current, must make adjustments. The partial loss of equilibrium at such times in the Humboldt Current's more or less steady northward flow would not be surprising. According to Schweigger (31), that is exactly what the Humboldt Current appears to do at periodic intervals, which, as Dr. Mears (18, 23) pointed out, seem to coincide with moon rather than sun cycles.

Because the significant ice discharge and attendant phenomena take place as far removed as possible in the circumpolar drift from the Humboldt Current area, there must be a distinct lag between interrelated occurrences, if there be interrelationship. The data are far too few for conclusive statements, but those few data seem to point to a lag of about a year after the unusual ice outbreak before the abnormalities in the Humboldt Current area begin to manifest themselves. It is about the third year before serious interruptions of normal conditions occur. An unusual ice outbreak came from the Weddell Sea in 1930 (14, p. 292) according to Mackintosh and Herdman, who were in the region at the time. Yet 1930 was a normal year in the Humboldt Current (31) according to Schweigger, of the Peruvian Fisheries Department, who was investigating the Humboldt Current over the period from 1928 to 1941. It was not until 1931, the year of Gunther's careful oceanographic examination of the current (10), that abnormal conditions tended to arise and not until 1932 that a serious interruption of cool weather conditions in Peru occurred (31). In 1938 ice was again exceptionally bad in the Weddell Sea outlet and its approaches (14, p. 292); in 1939 there were warm water invasions into the usual path of the Humboldt Current; but conditions along shore and throughout coastal Peru were not affected seriously until 1941 (9, 17, 19, 20, 21, 31), the third year after the ice outbreak from the Weddell Sea. Data regarding ice from the Weddell Sea before the disastrous years of 1891 and 1925 in the Humboldt Current region are not available to the writer.

Pettersson (26) stated that the tides affected the North Atlantic through the deep passages from the Arctic during the same year they did the South Atlantic from the Antarctic. The U. S. Ice Patrol (40) reported in 1922 that "the berg menace existed this year later than during any season since the patrol was taken over by the Coast Guard in 1914. . . . The presence of these [eleven] bergs so far south [around 43 degrees north latitude] is difficult to understand as we have had almost continuous southerly winds for the past month" (40, No. 10, p. 41). The third year after the unusual North Atlantic ice conditions in 1922 came the 1925 disaster in Peru. In 1938 the ice outbreak from the Arctic was again unusual (40), as it was from the Weddell Sea (14). Data fail regarding ice before the Humboldt Current debacle of 1891. But Tebbutt, of the Sydney Observatory, noted a tide during the southern winter of 1889, which was so high for three successive nights that the new gages could not measure it (37). The third year after these excessive tides came the notable invasions of tropical conditions and the resultant death to the abundant subtropical life in the Humboldt Current area (3, 28).

When ice and sea tide data fail, another suggestion of Dr. Mears' (22, 23) appears: there are tides in the air (2, 23, p. 101, 33, 36) and at air layer boundaries, these tides may be as significant as they are at boundaries be-

tween sea layers (22, 23). Certain it is that at normal times the cold arctic air masses do not seem able to escape over the Rockies (the great cordillera which under various names reaches from the Aleutians to Panama in North America) into the Pacific coastal region (23, pp. 29, 114-5). During significant years, 1922, 1937 (winter), 1889 (January and February), such escapes did occur (41) with appalling economic results to Californians from freezing. In 1922 and 1937 the air effect came previous to the ice outbreak. If tides cause both, the effect on the air would be immediate; that upon the ice might be delayed. In 1922 and 1937 the California freezes came first; the ice outbreaks came in the following seasons, in the North Atlantic, both during 1937 and 1938 (40); in the Humboldt Current, serious abnormalities came the third year following.

During the winter of 1948-49, the arctic air masses made their breaks over the Rockies into California. If events follow as they seem to have followed in 1889, 1922, and 1937, and as Dr. Mears suggested they may continue to follow in accordance with moon cycles, unusual ice outbreaks were due in both the North and South Atlantic in the proper seasons of this year, 1949. The Humboldt Current should begin to have abnormalities during 1950; it should have serious interruptions during the summer of 1951-52.

References

1. BARLOW, E. W. *Marine Observer*, 1938, **15**, 140.
2. BROOKS, CHARLES F. *Amer. meteorol. Soc. Bull.*, 1922, **3**, 167.
3. CARRILLO, CAMILO N. *Soc. geog. Lima Bol.*, 1892-3, **2**, 72.
4. CLOWES, A. J. *Discovery Rep.*, 1934, **9**, 59; 1938, **19**, 105.
5. COLBERT, L. O. *Sci. Mon.*, Wash., 1944, **59**, 435.
6. DEACON, G. E. R. *Discovery Rep.*, 1933, **7**, 233; 1937, **15**, 42, 110.
7. DOODSON, A. T. and WARBURY, H. D. *Admiralty manual of tides*. London: His Maj. Sta. Office, 1941. Pp. 38-39.
8. EARLAND, A. F. *Discovery Rep.*, 1936, **13**, 11.
9. GOODSPEED, T. H. *Plant hunters in the Andes*. New York: Farrar, 1941.
10. GUNTHER, E. R. *Discovery Rep.*, 1936, **13**, 158, 162, 226.
11. HART, T. J. *Discovery Rep.*, 1937, **16**, 445.
12. KANE, E. K. *Smith. Inst. Contrib. Knowledge*, 1863, **13**, 90.
13. MACKINTOSH, N. A. *Discovery Rep.*, 1937, **16**, 410.
14. MACKINTOSH, N. A. and HERDMAN, H. F. P. *Discovery Rep.*, 1940, **19**, 291-292.
15. MARMER, H. A. *Smith. Inst. ann. Rep.*, 1934, 181.
16. MEARS, E. G. *Science*, 1942, **95**, 433.
17. ———. *Amer. geophys. Union Trans.*, 1943, 242.
18. ———. *Sci. Mon.*, Wash., 1943, **57**, 331.
19. ———. *Smith. Inst. ann. Rep.*, 1943, 245, 249, 251.
20. ———. *J. Amer. acad. Sci.*, 1943, **33**, 125.
21. ———. *Nature*, Lond., 1944, **153**, 346.
22. ———. *Pacific Ocean handbook*. San Francisco: Hooper, 1944.
23. ———. Unpublished manuscript.
24. MURPHY, R. C. *Geog. Rev.*, 1939, **29**, 1.
25. PETTERSSON, HANS and KULLENBERG, B. *Göteborgs Kungl. Vetenskaps-ock Vitterhets-Samhälles Handlingar*, 1933, **5**, 3, 45.
26. PETTERSSON, OTTO. *Geog. Rev.*, 1929, **29**, 19, 121.
27. PETTERSSON, W. J. *Nature*, Lond., 1929, **123**, 796.
28. PEZET, FREDERICO ALFONSO. *Soc. geol. Lima Bol.*, 1895-6, **5**, 457.
29. REVELLE, ROGER R. *Scientific results of the seventh cruise of the "Carnegie"*. Washington: Carnegie Inst., 1944. P. 126.
30. ROOS, S. E. *Geog. Rev.*, 1937, **27**, 574.
31. SCHWEIGER, E. H. *Bol. Compañía Admin. Guano*, 1942, **18**, 27.
32. STETSON, HARLAN T. *Sciences*, 1935, **82**, 595.
33. ———. *Amer. meteorol. Soc. Bull.*, 1936, **17**, 101.
34. SVERDRUP, H. U. *Scripps Inst. oceanog. Contrib.*, 1941, 130.
35. ———. *Oceanography for meteorologists*. New York: Prentice-Hall, 1942. Pp. 62, 219-222.
36. TALMAS, C. F. *Amer. meteorol. Soc. Bull.*, 1932, **13**, 187.
37. TEBBUTT, J. *On the high tide of June 15-17th, 1889*. Sydney: Roy. Soc. N. S. W., 1889. Pp. 1-3.
38. THOULET, J. *Ann. Inst. Oceanog.*, 1928, **5**, 1.
39. WÜST, GEORG. *Berlin Univ. Inst. Meereskunde Veröff.*, 1929.
40. U. S. Coast Guard Internat. ice observ. and ice patrol service in the No. Atlantic Bull. 1922, **10**, 14, 23, 40; 1923, **11**, 12, 57; 1924, **12**, 74, 79, 83; 1926, **13**, 7; 1936, **26**, 5; 1937, **27**, 1, 2, 4, 6; 1938, **28**, 1; 1939, **29**, 11; 1940, **30**, v.
41. U. S. Wea. Bur. mon. wea. Rev., 1888, **16**, 8, 18; 1889, **17**, 8, 35; 1922, **50**, 41; 1938, **66**, 12, 215, 312.

NEWS and Notes

Science Writing Awards

Lester Grant, science reporter for the *New York Herald Tribune*, and **George W. Gray**, a free-lance writer living at Sparkill, New York, today were named winners of the fourth annual George Westinghouse Science Writing awards of \$1,000 each for the best science writing of 1949. The awards will be presented at a luncheon in honor of the writers on December 28 in New York City during the annual meeting of the AAAS, which administers the awards.

Mr. Grant will receive the award for what was adjudged the best newspaper science writing of the year, a series of 15 articles entitled "The Challenge of Cancer," published by the *Herald Tribune* June 6 through June 20, 1949. The magazine writing award went to Mr. Gray for his article on the human brain, "The Great Ravelled Knot," in the October 1948 issue of *Scientific American*, a work the judges considered the best magazine science writing during the contest year (August 1948 through September 1949). There were 75 entries in the news writing competition and 108 in the magazine field.

Honorable mention in the magazine field was voted by the judges to **Herbert Yahraes**, a free-lance writer of Stanfordville, New York, for his article, "How to Keep Away From the Dentist," which appeared in the March 1949 issue of *Harper's Magazine*.

Although Mr. Grant said later he had worked harder on the cancer series than on any previous science writing, he had not originally entered his series. Late in September John W. Tietz, of the Department of Biology, De Witt Clinton High School in New York City, wrote to the AAAS suggesting that the cancer series be considered. Asked if he did not wish to enter the competition in view of the nomination by an AAAS member, Mr. Grant submitted the cancer series on October

7—only 24 hours ahead of the deadline. Mr. Yahraes' article was submitted by *Harper's* and he then withdrew another article he previously had entered. Both Mr. Grant and Mr. Yahraes had been Nieman Fellows at Harvard, Mr. Grant in 1948 and Mr. Yahraes in 1943.

Mr. Grant, at 36, has been a newspaper man for 19 years and science reporter on the *Herald Tribune* for three years. He was born in Taft, California, but calls San Francisco his home town.

Mr. Gray is 63. Born in Caldwell, Texas, he has been a free-lance writer for many years. His articles have appeared in *The Atlantic Monthly*, *Harper's*, *This Week*, *The Yale Review*, *The American Magazine*, *The New York Times Magazine*, and *Scientific American*, among others. He was graduated from Harvard in 1912.

Judges this year, chosen as representatives of the general public, science, newspapers and magazines, were: Morris Meister, retiring president of the National Science Teachers Association and principal of the Bronx (New York) High School of Science, chairman; Henry R. Aldrich, secretary, Geological Society of America; Detlev Bronk, president, The Johns Hopkins University, and chairman, National Research Council; Kent Cooper, executive director, The Associated Press; John R. Dunning, nuclear physicist, Columbia University; Clifton Fadiman, a member of the board of judges of the Book-of-the-Month Club; Rudolph Flesch, readability consultant, and Edward Weeks, editor, *The Atlantic Monthly*.

Previous winners of the \$1,000 award for newspaper science writing are James G. Chesnutt, of the *San Francisco Call-Bulletin*, George Keaney, of the *New York World-Telegram*, and Frank Carey, science reporter in the Washington Bureau of the Associated Press. Previous winners in the magazine field are Steven M. Spencer, associate editor of *The Saturday Evening Post*, and Dr. Florence Moog, St. Louis scientist and writer.

The awards were established in 1946 to stimulate interest among young writers in making careers of science writing, and to encourage

high standards of science writing in newspapers and magazines.

About People

Vannevar Bush, president of the Carnegie Institution of Washington, has been elected a director of Merck and Company, Inc., manufacturing chemists of Rahway, New Jersey.

Roger Adams, head of the Chemistry Department, University of Illinois, and chairman of the American Chemical Society's Board of Directors, will be made honorary member of the American Institute of Chemists on January 13. The award will be made at a meeting of the Chicago chapter of the Institute, to be held at the Western Society of Engineers, Chicago.

George Sachs has resigned as director of the National Metallurgical Laboratory, Jamshedpur, India, and has established offices as consulting engineer in Cleveland. Dr. Sachs has been appointed president of the newly established Metals Research Associates, Inc., Cleveland. He will also act as consultant to the National Advisory Committee for Aeronautics.

The 80th birthday of **Wesley R. Coe**, professor emeritus of biology at Yale University, and visiting research associate at the Scripps Institution of Oceanography, was celebrated on November 11 at a dinner given by the faculty of the institution. Professor Coe was presented with a volume of complimentary letters from colleagues, fellow biologists, and former students.

William W. Rubey, staff research geologist of the U. S. Geological Survey, has been elected president of the Geological Society of America to serve during 1950.

Howard T. Evans, former head of the X-ray Diffraction Division of the Massachusetts Institute of Technology's Insulation Research Laboratory, has joined the staff of the Philips Laboratories, Irvington-on-Hudson, New York, for work on the application of x-ray crystallography to the study of the physics of solids.

Peter Bernfeld, formerly of the University of Geneva, has been appointed assistant professor of biochemistry at Tufts College Medical School. He will carry out enzymo-

logical research in the laboratories of the Cancer Research and Cancer Control Unit.

Visitors

Investigators working in the laboratories of the Department of Zoology, University of Chicago, include **P. Ferreira-Berrutti**, of the University of Montevideo (a Rockefeller Fellow); **Gert Andres**, of the University of Bern (Fellowship under the American Cancer Society); **Fiametta Rossetti**, of the University of Rome (Fellowship under Public Health Service Grant).

Grants and Awards

AAAS Research Grants have been awarded by the Washington Academy of Science to: **Edward C. Raney**, associate professor of zoology and fishery biology, Cornell University, \$150 for assistance in a study on the distribution of the fishes of Virginia; **Angus M. Griffin** and **Jeanne C. Moan**, Department of Bacteriology, School of Medicine, George Washington University, \$250 for assistance in completing a study on induced variations in the group of coliform organisms.

The British Royal Society has awarded two **Royal Medals** for 1949: to George Thomson, for his contributions to many branches of atomic physics, and especially for his work in establishing the wave properties of the electron; and to R. A. Peters, for his biochemical researches, in particular his investigations of the biochemical role of vitamin B₁ in tissue metabolism and of the toxic action of lewisite and other arsenical compounds. The Royal Society also awarded the **Copley Medal** to G. C. de Hevesy, for his work on the chemistry of radioactive elements and especially for his development of radioactive tracers; the **Davy Medal** to A. R. Todd, for his structural and synthetic studies in organic and biochemistry, with special reference to vitamins B₁ and E and the naturally occurring nucleosides; the **Sylvester Medal** to L. J. Mordell, for his researches in pure mathematics, especially for discoveries in the theory

of numbers; and the **Hughes Medal** to C. F. Powell, for his work on the photography of particle tracks in connection with the discovery of mesons and their transformation.

The **National Cancer Institute** recently awarded \$2,174,900 to 14 hospitals, universities, and other institutions for construction of cancer research facilities. The new awards are as follows: Boston University, \$49,900; Duke University, \$200,000; George Washington University, \$250,000; Loyola University's Stritch School of Medicine, \$200,000; Ohio State University, \$300,000; Oklahoma Medical Research Foundation, \$125,000; University of Pittsburgh, \$200,000; University of Southern California, \$200,000; Stanford University, \$100,000; the M. D. Anderson Hospital for Cancer Research, University of Texas, \$100,000; Wayne University College of Medicine and Detroit Institute of Cancer Research, jointly, \$150,000; Western Reserve University and the University Hospitals of Cleveland, jointly \$300,000.

The **Gorgas Award** for 1949 was presented to H. Trendley Dean, director of the National Institute of Dental Research, U. S. Public Health Service, at a meeting last month of the Association of Military Surgeons of the U. S. Dr. Dean received the award for his demonstration of the relation of fluoride-bearing waters to dental health.

New York University-Bellevue Medical Center has received two separate gifts totaling \$550,000: one of \$450,000 from Bernard M. Baruch; the other \$100,000 from the Louis J. and Mary E. Horowitz Foundation. The two gifts will be applied to the construction of that section of the Medical Center which will house the Institute of Physical Medicine and Rehabilitation in its new permanent home.

Harald H. Nielsen, chairman of the Department of Physics and Astronomy at Ohio State University, has been awarded the **Medal of the University of Liège** in recognition of his personal achievements in the field of infrared spectroscopy and his leadership of the Physics De-

partment at Ohio State. Dr. Nielsen is on leave of absence while studying and working in Europe under a Guggenheim Fellowship.

Fellowships, Scholarships, and Prizes

The National Science Fund will award, on behalf of the **Sugar Research Foundation**, a prize of \$25,000 for the most significant discovery in the utilization of sugar made during the past five years. Applications must be submitted by *February 1*, and the prize will be awarded March 15. Additional information may be obtained from the National Science Fund of the National Academy of Sciences, 2101 Constitution Avenue, Washington 25, D. C.

Availability of the Damon Runyon Clinical Research Fellowships has been announced by the American Cancer Society. In most cases a fellowship will provide a period of training in a hospital under the guidance of a qualified clinical investigator, but it may be awarded for training in a basic science provided that such training is directed toward preparing the fellow for clinical cancer research. Fellowships are administered by the society upon recommendation of the Committee on Growth of the National Research Council. Applications submitted prior to *March 1, 1950* will be acted upon during April. Communications should be addressed to the Executive Secretary, Committee on Growth, National Research Council, 2101 Constitution Avenue, Washington 25, D. C.

The **Edwards A. Deeds Fellowship** for research in physical science (engineering, metallurgy, chemistry, physics, mathematical physics, or any related subject) is being offered by the University College, Dundee, within the University of St. Andrews. The fellowship, open to both men and women, is of the value of £750 to £1050 per annum and is tenable for three years. The fellow will have the status of a university lecturer and, as part of his duties, may do a limited amount of advanced teaching in his department. Applications should be sent to Patrick Cumming,

Secretary, University College, Dundee, Scotland, not later than March 31, 1950.

Colleges and Universities

The Botany Department of the University of California at Berkeley has received an endowment fund of \$320,000 from the estate of the late Willis Linn Jepson, professor emeritus of botany. The will stipulates that the fund be used for care and maintenance of the Jepson herbarium and library, the completion of the *Flora of California*, the revision of the *Manual of the flowering plants of California*, and the furtherance of studies on the flowering plants of the state and adjacent areas.

A new course, "Introduction to Oceanography," has been added to the graduate curriculum in biological oceanography, recently introduced by the Narragansett Marine Laboratory of Rhode Island State College with the cooperation of the Woods Hole Oceanographic Institution. Lecturers include Columbus O'D. Iselin, Woods Hole director, and Charles J. Fish, Narragansett director.

The Johns Hopkins University has accepted responsibility for operation of the scientific research and administration of the Arctic Research Laboratory at Point Barrow, Alaska, under a contract with the Office of Naval Research. George E. MacGinitie has been appointed resident director of the laboratory to coordinate the research at Point Barrow. Prof. MacGinitie is on leave of absence from the California Institute of Technology. The work at the Arctic Laboratory will be entirely handled by university scientists and their work will be unclassified. The laboratory was established in August 1947 as a frontier arctic field station for basic scientific research of physical and biological phenomena never before studied in arctic environment.

Meetings and Elections

The National Research Council's new Building Research Advisory Board will hold its first research correlation conference Janu-

ary 11-12 in Washington, D. C. The conference, entitled "Weather and the Building Industry," will consider the climatological research and its effect on building design, construction, materials, and equipment. Francis W. Reichelderfer, chief of the U. S. Weather Bureau, and Paul Siple and Helmut Landsberg, of the National Military Establishment, will take part in the conference. Those wishing to attend should communicate with William H. Scheick, executive director of the Building Research Advisory Board, National Research Council, 2101 Constitution Avenue, Washington 25, D. C.

The Sixth Annual Conference on Protein Metabolism, sponsored by the Bureau of Biological Research at Rutgers University, New Brunswick, New Jersey, will be held January 27-28. Biosynthesis of the purines, effects of protein depletion on enzymes, transaminases and related enzymes in amino acid synthesis, alternative metabolic pathways leading to cancer, rates of plasma protein formation in man, and intravenous therapy in man will be discussed respectively by John M. Buchanan, University of Pennsylvania; Earl P. Benditt, University of Chicago; Irwin C. Gunsalus, Indiana University; Van R. Potter, University of Wisconsin; Irving M. London, Columbia University; and Charles S. Davidson, Boston City Hospital. The conference is open to all interested persons who register. Inquiries should be addressed to William H. Cole, Rutgers University, New Brunswick, New Jersey.

The third annual symposium on modern methods of analytical chemistry, sponsored by the College of Chemistry and Physics, Louisiana State University, will be held January 30-February 2 on the university campus. Further information may be obtained from Philip W. West, Department of Chemistry, Louisiana State University, Baton Rouge, Louisiana.

The American Society for Horticultural Science elected the following officers for the year 1949-50: president, S. L. Emsweller, Plant Industry Station, Beltsville, Maryland;

vice president, A. F. Yeager, University of New Hampshire, Durham; secretary-treasurer, Freeman S. Howlett, Ohio Agricultural Experiment Station, Wooster. H. B. Tukey, editor of the *Proceedings* since 1928, offered his resignation effective January 1.

Raymond F. Guy, manager of radio and allocations engineering of the National Broadcasting Company, has been elected president of the Institute of Radio Engineers for 1950. He will succeed Stuart L. Bailey, of Washington, D. C. on January 1. Sir Robert Watson-Watt, British radar authority, has been elected vice president.

The American Society of Professional Biologists, Inc., recently announced the election of the following officers: president, Roy F. Fritz, Department of Public Health, Berkeley, California; president-elect, Archie D. Hess, U. S. Public Health Service, Savannah, Georgia; treasurer, Alfred A. Draper, director of Steffan Laboratories, New York City; vice presidents, William Levin, director, Oregon Hygienic Laboratory, Portland, Oregon; H. Orin Halvorson, head, Department of Bacteriology, University of Illinois; Martin D. Young, U. S. Public Health Service, Columbia, South Carolina; Robert M. Johnston, director, Johnston Laboratories, Harrisburg, Pennsylvania; executive secretary, Norman C. Laffer, associate professor of bacteriology, University of Maryland.

Recently Received—

Nuclear Science Abstracts, U. S. Atomic Energy Commission. Vol. 3, No. 5. Technical Information Branch, Oak Ridge. 25¢.

1948 Annual Report of the John and Mary Markle Foundation. John and Mary Markle Foundation, 14 Wall Street, New York City.

Goethe and Pharmacy. George Urdang. American Institute of the History of Pharmacy, Madison.

A Half Century of Globular Clusters. Harlow Shapley. Harvard reprint 320. Harvard Observatory, Cambridge, Massachusetts.

The Society for Clinical and Experimental Hypnosis, 26 West 9th Street, New York City, is organizing a reprint library and would appreciate receiving two reprints each of any article dealing with hypnosis. Reprints may be forwarded to the society, attention of Jerome M. Schneek, chairman.

Mental Hospital Service, the clearinghouse soon to be established by the American Psychiatric Association to serve mental hospitals and other institutions caring for psychiatric patients in the U. S. and Canada, will have its headquarters in Washington, D. C., under the direction of Daniel Blain, medical director of APA. A grant from the Commonwealth Fund of \$45,000 made the project possible, but it is expected that it will eventually be self-supporting through subscription fees from participants.

The U. S. National Committee on Theoretical and Applied Mechanics, recently formed by seven national scientific and engineering societies, has been admitted as an adhering body to the International Union of Theoretical and Applied Mechanics. Member organizations of the committee are the Society for Experimental Stress Analysis, American Society of Civil Engineers, American Institute of Chemical Engineers, Fluid Dynamics section of the American Physical Society, Institute for Aeronautical Sciences, American Mathematical Society, and the American Society of Mechanical Engineers. Future plans call for American representation at a collegium on geophysics in 1950, and at a meeting of the IUTAM in Rome. Plans are now under way for an international congress for theoretical and applied mechanics to be held in the U. S. during 1951.

The reactor development program of the Atomic Energy Commission was the major subject under discussion at a press conference November 28—the first of an announced series of such conferences, to be held about once a month for the purpose of removing some of the secrecy surrounding atomic energy. Chairman David E. Lilienthal, whose

resignation from the AEC will be effective December 31, presided.

A "breeder" reactor, using fast neutrons to convert the nonexplosive and naturally occurring uranium 238 to fissionable plutonium, has been designed at Argonne National Laboratory, it was announced, and will be built next year at the commission's new nuclear reactor testing station near Arco, Idaho. The theoretical possibility of a pile that produces more fuel than it consumes was announced by the AEC two years ago. Now engineering work is more than 90 percent completed and the reactor will be tested about 18 months hence. Dr. Lawrence Hafstad, director of the reactor program, called the project "the biggest . . . peacetime development in atomic energy that has been made."

Another breeder is being developed to produce significant amounts of electric power, using neutrons in the intermediate energy range. Construction is expected to begin at the site of the Knolls Atomic Power Laboratory early next year. If successful, the Knolls reactor will point the way toward production of useful power without depleting the national supply of fissionable material.

The commissioners said they expected that by 1952 the AEC would be building an atomic engine for ship propulsion. They also announced the design of an experimental reactor to provide information on the behavior of materials under severe radiation conditions. This is of particular interest in the development of reactors for the propulsion of aircraft.



A RECENTLY DEVELOPED TECHNIQUE for producing very thin slices of solid layered material made possible this transmission electron micrograph of a splitting of synthetic fluorine-phlogopite mica, showing laminar morphology of the mica. The dark bands are believed to be electron optical effects. Althea Revere, associate professor of electron microscopy at Stevens Institute of Technology, Hoboken, New Jersey, developed the technique and prepared the micrograph. Magnification 10,000 \times with resolution.